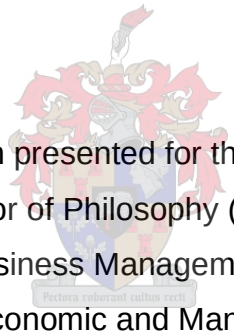
Annuity decision-making

Jeannie de Villiers-Strijdom



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Declaration

By submitting this dissertation electronically, I, Jeannie de Villiers-Strijdom, declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

J. de Villiers-Strijdom 1 March 2021

Abstract

As a standard practice, retirement capital is converted into a subsequent income stream. There are two main annuity income products to choose from, namely: (i) a guaranteed/life annuity (or annuitisation); and (ii) a living annuity (or self-annuitisation). The former guarantees an annuity income for life, whereas the latter exposes capital to volatile investment returns, with the possible danger of depletion before death, especially in the wake of excessive withdrawals. The world-wide phenomenon of reticence among retirees to protect themselves against longevity risk, is an annuity puzzle that has been the subject of vigorous academic debate.

This study investigated the factors that relate to individuals' annuity perceptions, intention and satisfaction. Based on existing literature in this field, a theoretical framework is presented with respect to the annuity puzzle, on the basis of which two questionnaires are designed as measurement instruments, namely: (i) a questionnaire for employees who are members of various retirement funds in order to ascertain the factors that relate to annuity perception and intention; and (ii) a questionnaire for pensioners, in order to measure their satisfaction levels that relate to the eventual outcome of their annuity choice.

Based on an investigation into the factors that relate to annuity decision-making, the principal conclusions of this study are: (i) a bias towards self-annuitisation before retirement is mainly related to investor confidence in earning an above-average income based on the capital growth generated by the underlying capital, although the accompanying issues with respect to managing these investments often prove problematic; (ii) the bequest motive, which refers to the desire to leave retirement capital to heirs, often results in an unjustified belief in living annuity desirability, with the possible negative outcome of outliving retirement capital and facing poverty in retirement, the result of which could lead to dependency on the state or family members; (iii) a substantial impact on individuals' perception and intention to annuitise, is the expectation of a predictable and consistent annuity income stream, without continuous involvement in investment decision-making; (iv) trust in the integrity of financial advisors significantly relates to individuals' annuity perceptions and intentions.

Finally, this study presents a new annuity decision-making tool, consisting of two questionnaires and user's manuals, to be used by benefit counsellors and financial advisors, in guiding their clients with respect to their choice of an optimal annuity income option.

In summary, this study therefore provides further insights into the intriguing annuity puzzle.

Key words

Annuity puzzle, annuity income product(s), living annuity (self-annuitisation), guaranteed (or life) annuity (annuitisation), annuity decision-making, retirement satisfaction, longevity risk, investment risk

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"I am the Light of the World, says the Lord; whoever follows me will have the light of life."

John 8:12

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List of acronyms and abbreviations

ABI	Association of British Insurers
AEW	annuity equivalent wealth
AHEAD	Assets and Health Dynamic among the Oldest Old
AIP(s)	annuity income product(s)
ALSI	All Share Index
ANOVA	Analysis of variance
ASISA	Association for Savings and Investment South Africa
Ben perc	benefit perceptions
CA	Cronbach's alpha
CES-D	Center for Epidemiologic Studies Depression (scale)
CPI	consumer price index
D	determinant(s)
DB	defined benefit
DC	defined contribution
Dep	dependent
DIP	differences in perception
DIPREF	differences in preference
DV	dependent variable
EDPV	expected discounted present value
EFA	Exploratory Factor Analysis
ELSA	English Longitudinal Study of Ageing
ETFs	Exchange Traded Funds
FAs	financial advisors
FIN	financial
FINS	financial security
GA	guaranteed annuity
GEN	general
HE	hypothesised effect(s)
HRS	Health and Retirement Study
ILLA	investment linked living annuity
Indep	independent

JSE	Johannesburg Stock Exchange
LIV	living annuity
MPG	minimum pension guarantees
MWR	money's worth ratio
n.s.	non-significant
N/A	not applicable
NPV	net present value
PCA	public care aversion
PhD	Doctor of Philosophy
POM	peace of mind
POPI	The Protection of Personal Information Act 4 of 2013
PSID	Panel Study of Income Dynamics
R	rationale(s)
RC	retirement capital
RHLS	Retirement History Longitudinal Survey (USA)
RIT	retirement income trust
ROI	return on investment
RSA	Republic of South Africa
SARS	South African Revenue Services
SE	standard error (of the estimate)
SHIW	Survey of Household Income and Wealth (Italy)
SOAG	social old age grant
SPSS	Statistical Package for the Social Sciences (statistical analysis software)
Std Dev	standard deviation
TIAA-CREF	Teachers Insurance and Annuity Association of America College Retirement Equities Fund
UK	United Kingdom
US(A)	United States (of America)
USRF	University of Stellenbosch Retirement Fund
VIF	variance inflation factor
VUAP	variable(s) used as proxy

CHAPTER 1:
INTRODUCTION

Use wisely your power of choice – Og Mandino (1968).

1.1 OVERVIEW

This study is about retiree decision-making on how to convert accumulated retirement fund savings into income, with the view to lasting sustainment of quality living.

1.2 BACKGROUND TO THE STUDY

Financial decision-making at the time of retirement is perplexing, as individuals must decide how to convert their lifetime accumulation of financial resources into an income stream to meet various needs, usually ill-formulated, over an unknown period, with little recourse for recovery in the event of failure (Rusconi, 2006: 4).

One of the biggest risks faced by retirees today is called *longevity risk*, which can be defined as the risk of outliving one's assets (Davidoff, Brown & Diamond, 2003: 1). Longevity risk is singled out as the biggest threat to retirement income security, a central policy concern of our time, especially in the wake of longer life expectancy, retirement savings buffeted by poor investment performance, as well as continual increases in medical costs (Blitzstein, Mitchell & Utkus, 2006: 5).

If a retiree could have predicted with certainty his/her length-of-life, future investment returns, expenditure shocks and inflation, he/she would merely amortise wealth to receive a real income every month until all funds are depleted on the last day of his/her life. However, in reality, retirees must face many unknowns (Brown, 2007: 3).

One of government's main goals in providing for the establishment of retirement funds is to ensure that members receive a benefit at retirement, which will enable them to purchase an income for life, to maintain their standard of living. According to legislation governing retirement funds (except for provident funds), retirees are obligated to purchase an annuity income product (AIP), or annuity income products (AIPs) with at least two-thirds of their accumulated retirement fund capital. However, from 1 March 2021, this provision will also apply to provident funds (Momentum, 2019). Generally, there are two AIPs to choose from, i.e. life annuities and living annuities.

A *life annuity,*[1] also referred to as annuitisation or guaranteed annuity, is a contract between an annuitant and an insurance company, whereby the insurance company guarantees to pay the annuitant a predetermined income for the rest of his/her life, in exchange for an initial capital lump sum or premium. Life annuities offer annuitants complete protection against longevity and investment

[1] A guaranteed (or life) annuity is also referred to as a fixed immediate annuity in international literature, and a traditional or conventional annuity in South African literature.

risk. The choice of purchasing a life annuity is irrevocable, and the life annuitant forgoes the possibility of leaving a bequest to heirs at death (except if a guarantee term applies). In other words, a life annuity ends with your *life*. Although the life annuitant bears no investment (or market) risk, he/she may be exposed to credit/default risk (Glacier, 2018). Life annuities predate stocks and bonds with an approximate history of 3 500 years (Milevsky, 2013: vii, 6).

From here onwards the term 'guaranteed annuity' is used throughout as it means the same as life annuity. This is done to avoid confusion with the term 'living annuity' explained next.

In contrast, a *living annuity,*[2] also known as self-annuitisation, is an investment portfolio from which the annuitant withdraws income, within prescribed annual limits. Living annuities offer the annuitant no protection against longevity risk, and the living annuitant bears all investment (or market) risk, but with the possibility of leaving heirs a bequest of the remaining retirement capital at death (Glacier, 2018). In other words, with a *living* annuity, your remaining capital keeps on *living*.

Although the guaranteed income stream of payments provided by guaranteed annuities, in most cases, seems to be the appropriate way to eliminate longevity and investment risk, it is an established fact that only a small percentage of individuals actually purchase them. This worldwide phenomenon has been dubbed 'the annuity puzzle' (National Treasury, 2012: 26; Milevsky, 2013: vii).

The low uptake of guaranteed annuities is especially puzzling, given the substantial body of economic literature, which shows that guaranteed annuities provide the most benefits, by virtue of the substantial protection it offers against the risk of outliving retirement capital (Davidoff, Brown & Diamond, 2005: 1 589).

Notwithstanding the protection guaranteed annuities afford against longevity and investment risk, it seems to be undervalued and poorly understood by various role players. For instance, retirement income planning software programs used by financial advisors usually ignore the uncertainty of length-of-life, by basing calculations on naïve assumptions regarding the retiree's life expectancy. In addition, assumptions regarding investment returns are sometimes unrealistically high and do not take volatility into account. Anecdotal evidence also suggests that the protection that guaranteed annuities afford against low consumption in old age is often underplayed by financial advisors who guide their clients in choosing an appropriate AIP (Brown, 2007: 3).

Furthermore, the annuity puzzle has intensified with the dominant focus in both academia and practice on savings and investments before retirement, resulting in many believing retirement

[2] A living annuity is also referred to as an investment-linked living annuity (ILLA), flexible annuity, or linked annuity in South African literature, whereas in international literature it is also referred to as a phased-withdrawal product or a variable annuity.

planning to be synonymous with wealth accumulation.[3] Even though building a nest-egg is an essential part of securing financial wellbeing in retirement, deciding how accumulated wealth will be converted into a stream of consumption in retirement should be regarded as equally important. Consequently, a comprehensive retirement income plan should consider not only how one should save, but also how one should spend (Brown, 2007: 3).

The annuity puzzle seems to apply especially in the South African context, as the demand for guaranteed annuity products is declining, whereas the demand for living annuities is growing rapidly. In 2003, 50 percent of single premiums were used to purchase guaranteed annuities, but in 2011, this figure had fallen to 14 percent (National Treasury, 2012: 4-5).

The Association for Savings and Investment South Africa (ASISA) reported that living annuities accounted for 90 percent of annuity sales in 2015. This seems to be in contrast with the findings of two surveys performed by Sanlam in 2015 and Just Retirement South Africa in 2016, that found 87 percent and 86 percent respectively of respondents between the ages of 55 and 85, preferred a guaranteed income for life (Anderson & Empedocles, 2016: 49).

1.3 RESEARCH FRAMEWORK

1.3.1 Problem statement

Contrary to the prescriptions of economic theory, observed levels of annuitisation are generally significantly lower than those considered optimal by most economists (Milevsky, 2013: 94). This international phenomenon, dubbed the ‘annuity puzzle’, seems to apply especially in the South African context, as the demand for living annuities is increasing, while the demand for guaranteed annuities is declining (National Treasury, 2012: 4-5). The annuity puzzle is a central policy concern of our time as it may result in the adverse economic situation that many retirees outlive their retirement capital. This in turn may lead to increased reliance on the state.

In addition, in light of anticipated proposals for retirement reform, as well as the continued shift away from defined benefit (DB) to defined contribution (DC) retirement funds, it is a widely-held belief among scholars and government alike, that a better understanding of the annuity puzzle is essential, as the future financial security of retirees depends on it (Blitzstein et al., 2006: 8). Recent flat share market returns as delivered by the JSE All Share Index (ALSI) from 2016 to the present time (January 2021), as well as longer life expectancies of retirees due to medical innovation, have focused policy-makers’ attention on the vulnerability of future retirees to investment and longevity risk.

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[3] A Google search on retirement planning delivers over 1.2 million hits that guide readers to websites discussing savings and investments prior to retirement (Brown, 2007: 3).

1.3.2 Purpose of the research

Despite the substantial body of scholarly literature that attempts to explain the annuity puzzle, there appears to be little empirical evidence to guide our understanding of who annuitises and why. It is an established fact that very little is known about the factors that relate to South Africans' decisions about AIPs (Rusconi, 2006; De Beer, 2015). Testing existing annuity theory empirically, as is done in this study, is essential to increase our understanding of the annuity puzzle, by identifying the factors that relate to annuity perceptions, intention and satisfaction in the South African market, with the end goal of assisting all stakeholders to deal with this issue optimally.

1.3.3 Research questions

Based on the problem statement and purpose of the research, this study attempted to answer the following research questions:

i) Which factors relate to the pre-retirement *benefit perceptions* of annuities?

ii) Which factors relate to the *intention to annuitise* retirement capital? and

iii) Which factors are associated with *satisfaction levels* as they relate to the eventual outcome of the AIP choice?

1.3.4 Research objectives

The *primary objective* this study was to investigate the factors that relate to annuity decision-making. In order to achieve the primary objective, the *secondary objective* of this study was threefold: (i) to identify the factors that relate to an individual's benefit perceptions who intended to purchase either a living or a guaranteed annuity respectively (before retirement); (ii) to identify the factors that relate to an individual's intention to annuitise, or not[4] before he/she reaches retirement; and (iii) to identify the factors that associate with retirees' satisfaction levels with respect to the eventual outcome of their annuity choice.

This study consists of two parts. In Part 1, annuity benefit perceptions and subsequent intention to annuitise were investigated; whereas in Part 2, the satisfaction levels of annuitants were measured, as they relate to the eventual outcome of their AIP choice. The parts in this study run concurrently with distinctive samples that are independent from one another. Subsequently, there exists no link between the two parts of the study.

[4] Having no intention to annuitise, refers to self-annuitisation in this study.

1.3.4.1 Part 1: Benefit perceptions and intention to annuitise, or not

The first part relates to members of DC retirement funds who must make an annuity decision sometime in the future. As they have not yet reached retirement, they only have an intention to annuitise. For the purpose of this study, members of various retirement funds were *inter alia* questioned regarding their intention to annuitise or not.

1.3.4.2 Part 2: Satisfaction levels in retirement

The second part relates to individuals who have already made an annuity decision and are hence fully retired from various retirement funds. For the purpose of this study, individuals who already receive annuity income payments, were questioned regarding *inter alia* their satisfaction levels regarding their AIP choice.

1.3.5 Research design and methodology

1.3.5.1 Overview

This research study was undertaken in two parts. In Part 1 the factors that relate to individuals' benefit perceptions of a living versus a guaranteed annuity were established. Also, the factors that relate to respondents' intention, before they reach retirement, to annuitise or self-annuitise, were determined. In Part 2 the different factors that associate with individuals' satisfaction levels with respect to the eventual outcome of their annuity choice, were ascertained.

1.3.5.2 Population and sample

Part 1: The target population for Part 1 of the study were employees permanently employed in the formal sector and who are members of their employer's DC retirement fund as a condition of employment. The total sample for Part 1 of the study consisted of two sub-samples, as follows: (i) members of the University of Stellenbosch Retirement Fund (USRF); and (ii) members of the Exxaro Retirement Funds.

Part 2: The target population for Part 2 of the study were individuals currently in receipt of either living or guaranteed annuity income payments, or a combination of both living and guaranteed annuity income payments. The total sample for Part 2 of the study consisted of two sub-samples, as follows: (i) former employees of Stellenbosch University (SU), who are fully retired from the USRF; and (ii) Glacier annuity clients, who receive either living or guaranteed annuity income payments, or a combination of both living and guaranteed annuity income payments.

1.3.5.3 Data collection and measurement instrument

In this study, cross-sectional (as opposed to longitudinal) primary data was collected by conducting surveys/questionnaires among a group of target respondents. Online questionnaires were constructed based on annuity literature, as well as consumer decision-making theory. The first draft questionnaires for both Part 1 and Part 2 were completed by 10 individuals nearing retirement and 10 pensioners respectively, in order to identify and correct any hitches in the questionnaires. The final questionnaire for Part 1 was subjected to a thorough pre-test, mainly as a pre-run for using the survey software programme called Qualtrics. An invitation to participate in the study was sent by either the principal officer of the retirement fund, the human resources manager or another senior executive of the company. For a copy of the invitation letters sent to participants for Part 1 and Part 2 of the study, as well as a link to the survey, see Appendix A.

1.3.5.4 Data processing

In order to process the primary data obtained from the questionnaires, the following methods were employed for data analysis in SPSS.[5]

Part 1:

i) **Multiple regression analysis[6]**: Multiple regression analysis is an ideal statistical method for Part 1 of the study, in which the factors that relate to individuals' benefit perceptions of a living versus a guaranteed annuity were ascertained. A linear regression is mainly used to explain the variation in the dependent variable that can be attributed to variation in the independent variables. The relationships between the dependent[7] and independent variables[8] were determined, and the various strengths of these relationships were quantified.

ii) **Logistic regression analysis[9]**: A logistic regression analysis is a type of regression analysis involving the prediction of a dichotomous (or binary) dependent variable, usually coded '0' for 'no/failure' and '1' for 'yes/success', using nominal, ordinal, interval, and/or ratio-level independent variables. The legitimacy of the independent variables[10] to predict the dependent variable[11] is determined. Logistic regression analysis is an ideal statistical method for Part 1 of the study, due to the dichotomous dependent variable.[12]

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[5] Statistical Package for the Social Sciences; a statistical analysis software program.

[6] A number of at least 100 respondents is preferable for this statistical technique (Pallant, 2016: 154-155).

[7] The benefit perceptions of a living versus a guaranteed annuity.

[8] For example, risk aversion and financial literacy.

[9] A number of at least 100 respondents is preferable for this statistical technique (Hair, Black, Babin & Anderson, 2014: 313-339).

[10] For example, risk aversion and financial literacy.

[11] The intention to choose either a living or a guaranteed annuity.

[12] The dichotomous dependent variable refers to the respondent's intention to annuitise (coded as 1), or self-annuitise (coded as 0).

Part 2:

i) **Multiple regression analysis**[13]: Multiple regression analysis is an ideal statistical method for Part 2 of the study, in which the factors that are associated with retirees' satisfaction levels as they relate to the eventual outcome of their AIP choice were examined. A linear regression is mainly used to explain the variation in the dependent variable that can be attributed to variation in the independent variables. The relationships between the dependent variable[14] and the independent variables[15] were determined and the various strengths of these relationships were quantified.

1.4 RELEVANCE/SIGNIFICANCE AND CONTRIBUTION OF THIS STUDY

The South African retirement fund system provides a good basic structure to members with respect to their financial security after retirement. As a rule, an employee is usually obliged to belong and contribute to his/her employer's retirement fund as a condition of employment. The process of saving for retirement runs mostly automatically from this point onwards, with retirement fund contributions being deducted from an employee's salary and invested on his/her behalf. The employee/member also benefits from economies of scale in terms of competitive fund administration and investment costs, as well as affordable group life insurance benefits. It is not expected of the employee/member to make difficult investment or product decisions during the wealth build-up or accumulation period, as retirement fund trustees are mandated by law to make such decisions on the members' behalf.[16] Moreover, according to law, the underlying fund capital is protected and preserved for retirement, as early withdrawals are only allowed under certain circumstances. Furthermore, employees benefit from tax deductions in terms of their contributions and do not pay any tax on investment returns.

In many ways the support structure for members of retirement funds seems to come to an abrupt end at retirement, as employees now suddenly face the challenge of converting their accumulated retirement fund capital into a sustainable income for life. South Africa has a sophisticated retirement fund industry offering many types of AIPs. Individuals are often ill-equipped to consider many interrelated factors when choosing an appropriate AIP. Subsequently, they often seek assistance from financial advisors, many of whom may not necessarily have their clients' best interests at heart, as they receive financial incentives to promote a certain AIP over the other.

In addition, financially inexperienced and/or illiterate individuals may be unable to appreciate and understand the complex product features when comparing AIPs with each other. Amongst others, such interrelated factors and product features include the impact of volatile financial markets and

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[13] A number of at least 100 respondents is preferable for this statistical technique (Pallant, 2016: 154-155).

[14] Satisfaction levels.

[15] For example, risk aversion and financial literacy.

[16] In some cases, members do make investment and other product decisions if they do not choose the 'default option'.

high charges in the case of certain AIPs, the retiree's individual needs, preferences, family situation, as well as uncertainties about health and longevity.

Choosing an AIP that is inappropriate can leave retirees financially vulnerable as they grow older, especially when they are no longer able to earn additional income.

Hence, in order to address the apparent shortcomings in the support structure of the retirement fund system to assist retirees with the task of making an optimal AIP choice, this study has value on two levels, i.e. a theoretical contribution and industry contribution, as discussed below.

1.4.1 Theoretical contribution

Contrary to the recommendation based on economic theory, very few people avail themselves of the benefits that annuitisation provides. Scholars have been grappling with this phenomenon, dubbed the 'annuity puzzle', for many decades. There is still little empirical evidence on the reasons why individuals choose not to annuitise their accumulated retirement capital. The overarching contribution of this study is therefore to contribute to the existing annuity puzzle literature, by deepening our understanding of how people make annuity decisions. The factors that relate to annuity decision-making, namely annuity perception, intention and satisfaction, were established. As most of the existing annuity literature on decision-making has been conducted in the context of first world countries, for example the United States of America (USA), United Kingdom (UK) and Switzerland, a contribution is also made to the debate of annuity decision-making in the context of a developing country, with specific reference to South Africa.

1.4.2 Industry contribution

The introduction of factors that relate to annuity decision-making, namely annuity perception, intention and satisfaction, makes an industry contribution on the following levels:

i) Education, by assisting employers (or human resources departments) and retirement fund trustees to pro-actively educate employees with respect to optimal AIP decision-making;
ii) Marketing, by providing important insights to financial product providers with respect to the factors that relate to guaranteed annuity benefit perceptions;
iii) Default annuity strategy, by giving retirement fund trustees scientific evidence on which to base their choice of a suitable default annuity income strategy;
iv) An annuity decision-making tool, consisting of two questionnaires and user's manuals, to be used by benefit counsellors and financial advisors to guide their clients in making an informed and well-considered decision with respect to their choice of an optimal AIP that is in their best interest over the long term.

1.5 OVERRIDING CONCLUSIONS

The multi-faceted factors that relate to annuity decision-making were investigated, with the view to assist retirees with the consequential task of choosing an appropriate AIP.

The overriding conclusion is that retirement income security depends *inter alia* on the following:

i) **The ability to critically examine the underlying motives for favouring any particular AIP.** For example, the bequest motive, which refers to the desire to leave retirement capital to heirs, often results in an unjustified belief in living annuity desirability, with the possible negative outcome of outliving retirement capital and facing poverty in retirement, the result of which could lead to dependency on the state or family members.

ii) **Education and awareness about the various cognitive biases present in annuity decision-making.** In this way, bias towards self-annuitisation before retirement is mainly related to the belief in earning an above-average income based on the capital growth generated by the underlying capital, although the accompanying issues with respect to managing these investments often prove problematic.

iii) **The rational evaluation of AIP suitability, without unwarranted prejudice.** For instance, a substantial impact on individuals' perception and intention to annuitise, is the assurance of a predictable and consistent annuity income stream, without continuous involvement in investment decision-making.

iv) **Trust in the integrity of financial advisors significantly relates to individuals' annuity perceptions and intent.** Financial advisors have a big role to play in helping their clients examine underlying motives, creating awareness of cognitive biases and rationally evaluating AIP suitability.

1.6 SCOPE AND LIMITATIONS

The scope and boundaries of the study are presented according to subheadings, as follows:

i) **Sample**. In Part 2 of the study, the factors that associate with the satisfaction levels of annuitants were investigated as these factors relate to the eventual outcome of their annuity decision. Unfortunately, due to so few retirees choosing a guaranteed annuity as part of their retirement income strategy as is predicted by the annuity puzzle, the sample consists only of living annuitants.

ii) **Methodology**. The cross-sectional data collection methodology required different samples for Part 1 and Part 2 of the study.

iii) **Scale development**. In Part 1 and Part 2 of the study, questions (or items) grounded in theory were derived from previous questionnaires, *inter alia*. A few factors could not be compared with those of other researchers, due to a lack of existing empirical evidence.

1.7 DISSERTATION STRUCTURE

The research study is organised in nine chapters, as follows.

Chapter 1 provides a brief overview of the study.

Chapter 2 gives a theoretical framework for annuities.

Chapter 3 provides a synopsis of decision-making theory.

Chapter 4 summarises both international and South African literature on annuity puzzle theory.

Chapter 5 elaborates on the research plan followed to conduct this study.

Chapter 6 presents the research results/findings of Part 1.

Chapter 7 presents the research results/findings of Part 2.

Chapter 8 discusses the conclusions, based also on a reconciliation of the main results/findings with existing literature.

Chapter 9 offers implications of this study, followed by limitations and recommendations for future research.

1.8 SUMMARY

In this chapter the deep-rooted need for the restructuring of the retirement system was established, in order to understand and possibly address the low uptake by retirees of an AIP that protects its holders from investment and longevity risk.

This study therefore strives to guide and inform the debate on the restructuring of the retirement system, by exploring, as a meaningful starting point, the reasons why people make decisions with respect to AIPs.

This objective is achieved by (i) investigating the factors that relate to individuals' annuity benefit perceptions and eventual AIP intentions pre-retirement; and (ii) measuring retirees' satisfaction levels several years into retirement as they relate to their annuity choices.

The results/findings produce: (i) an identification of the factors that relate to annuity perception, intention and satisfaction; and (ii) an annuity decision-making tool for possible application by financial advisors/benefit counsellors in guiding their clients with respect to their choice of an optimal AIP.

It is hoped that the outcome of this study provides a deeper insight into the intriguing annuity puzzle with the view to assist various industry role-players to guide retirees in optimal annuity income decision-making, in order to restore the promise of retirement income security.

Chapter 1 conceptualised the study with a brief background. A research framework for the study was then presented by formulating a problem statement, purpose of the research, research questions and objectives.

Next, the research design and methodology followed to conduct this study were provided, followed by an introductory summary of this study's relevance/significance, contributions and overriding conclusions. The chapter concluded with scope and limitations, as well as a structure for the dissertation. The following chapter offers a theoretical outline for annuities.

CHAPTER 2:
ANNUITY INCOME PRODUCTS

2.1 INTRODUCTION

A theoretical outline for annuities is provided as follows. Section 2.2 describes legislation that governs retirement funds and annuity options in South Africa. Section 2.3 gives perspective on retirement income and fund reform in South Africa. Section 2.4 gives a brief summary of the various types of annuity options available to South African individuals at retirement.

2.2 SOUTH AFRICAN RETIREMENT FUND LEGISLATION

As illustrated in Figure 2.1, retirement funds in South Africa consist of two broad categories, namely occupational schemes and individual schemes. Two retirement funds resort under occupational schemes,[17] namely: (i) pension funds and (ii) provident funds. Each of these can be classified either as defined contribution (DC) or as defined benefit (DB) funds, as discussed later.

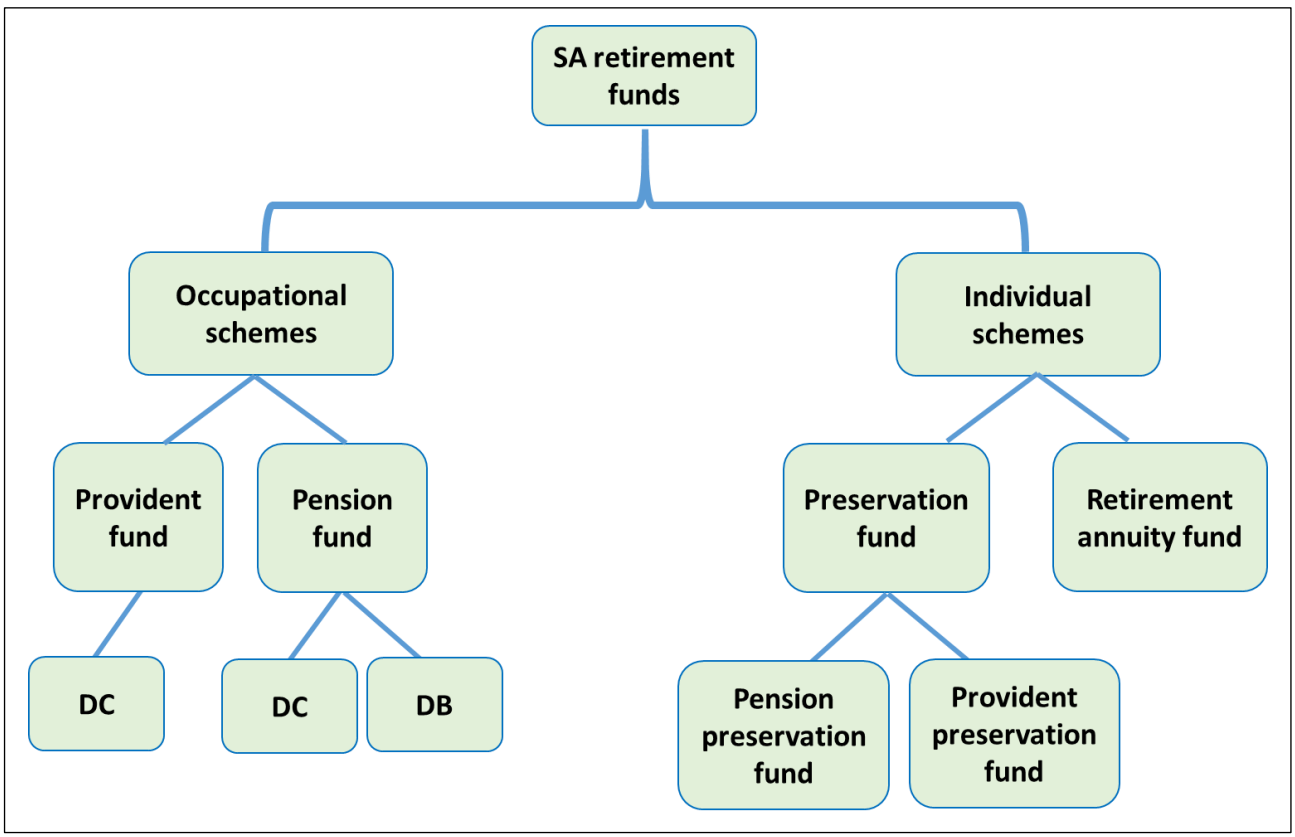

Figure 2.1: The South African retirement fund landscape

Source: Author's conception.

[17] South African individuals employed in the formal sector are likely to be members of their employers' retirement funds as a condition of employment.

In contrast, individual schemes are available to those members who do not belong to an occupational scheme, as well as to individuals who wish to make additional retirement savings outside of an occupational scheme and/or who wish to preserve money paid out from an occupational scheme (Botha, Du Preez, Geach, Goodall & Rossini, 2017: 904). Retirement annuity funds, pension preservation funds and provident preservation funds resort under individual schemes.

The Pension Funds Act 24 of 1956 (RSA, 1956) does not distinguish between the different types of retirement funds in South Africa. These distinctions are prescribed in the Income Tax Act 52 of 1962 (RSA, 1962). In terms of the definitions of pension funds, pension preservation funds, as well as retirement annuity funds, members may commute a maximum of one-third of their benefits at retirement by way of a lump sum (except where the entire retirement fund value does not exceed R247 500 or where the employee is deceased). The remaining two-thirds must be used to purchase a compulsory annuity (e.g. a guaranteed annuity or a living annuity). Therefore, retirement fund retirees, with the exception of provident and provident preservation funds, are mandated by law to make an annuity decision at retirement with respect to at least two-thirds of their retirement fund capital. From 1 March 2021, provident and provident preservation funds will be aligned to pension funds, pension preservation funds, and retirement annuity funds (Momentum, 2019).

Retirement funds are permitted to provide an annuity to a retiring member by paying the annuity directly, or by purchasing the annuity in the name of the fund from a South African long-term insurer or investment house, or by purchasing the annuity in the name of a retiring member from a South African long-term insurer or investment house. While the aforementioned methods may be provided for in the rules of a retirement fund, a member may select only one of them and not a combination.[18]

According to General Note 18 to the Income Tax Act 52 of 1962 (RSA, 1962), the annuity must be compulsory, non-commutable, payable for and based on the lifetime of the retiring member and may not be transferred, assigned, reduced, hypothecated or attached by creditors as contemplated by the provisions[19] of the Pension Funds Act 24 of 1956 (RSA, 1956).

Occupational schemes (i.e. pension funds or provident funds) can be structured on a defined contribution (DC) or defined benefit (DB) basis. Under a DC fund, the contributions made by the member and the employer are defined as a percentage of the member's current salary. The ultimate benefit, which is payable to a member is a function of the contributions paid to the fund, costs and investment performance. In this type of funding structure, the member bears the risk of poor investment returns and increasing fund costs. In a DC scheme, the employer does not accept responsibility for the investment returns and longevity risks associated with a pension benefit, as is

[18] General Note 18 to the Income Tax Act 52 of 1962 (RSA, 1962).
[19] Sections 37A and 37B.

the case with DB schemes (Botha et al., 2017: 934). Hence, a member of a DC fund is fully responsible for providing himself or herself with a pension for life.

In the case of a DB fund, the benefit to which the member is entitled at retirement is not based on the contributions plus growth, less costs method. Although the member and employer may contribute to the fund, the retirement benefit is based on the member's final salary, and is calculated by using a formula, which is incorporated in the rules of the fund (e.g. 2% multiplied by years of membership, multiplied by final salary). In this type of funding structure, the employer bears the risk of poor investment performance and rising fund costs. The employer is responsible for providing the member with a pension for the duration of his/her lifetime after retirement (Botha et al., 2017: 930).

Over the past few decades, there has been a shift away from DB to DC pension schemes that has taken place not only in South Africa, but also in many countries elsewhere (National Treasury, 2007: 26). After retiring from retirement annuity funds, pension preservation funds, or provident preservation funds, the member also bears the risk of poor investment returns and increasing fund costs, and is fully responsible for providing himself or herself with an income for life.

2.3 PROPOSED RETIREMENT INCOME AND FUND REFORM

The annuity puzzle holds the adverse economic implication that many retirees outlive their retirement capital. This could have the undesirable effect of retirees becoming dependent on family members and/or government by way of the social old age grant (SOAG).

2.3.1 Perspective on retirement income security

In 2012, National Treasury published a discussion paper called: *Enabling a better income in retirement* (National Treasury, 2012). Several red flags or concerns were identified that could hinder retirement income security among retirees in old age.

2.3.1.1 Control over retirement capital

The first red flag concerns the *control* living annuitants have over their *retirement capital*, which is distributed through their retirement years, subject to an annual minimum withdrawal rate of 2.5 percent and maximum of 17.5 percent of the underlying retirement capital or investment amount. It is therefore expected of living annuitants (either with or without the help of a financial advisor), to be able to calculate the optimal rate at which to draw down assets. This optimisation problem is multi-faceted and rests on various assumptions that are difficult to get right precisely.[20]

[20] The optimisation problem retirees face includes the timing of retirement. The optimal retirement age is a function of investment returns, life expectancy and health outcomes, which are all difficult to predict. However, if a retiree can calculate the income level he/she requires to comfortably sustain him- or herself, it could be easily ascertained if the required income stream matches what a life insurer can pay in the form of guaranteed annuity payments, failing which, retirement could be postponed (Benartzi, Previtero & Thaler, 2011: 147-148).

Living annuitants also often lack the self-discipline to stick to any specific chosen drawdown plan. As a result, retirees may either underspend or overspend.

The evidence of ominously high drawdown rates in South Africa specifically, exposes living annuitants to the risk of ending up in poverty in later retirement years. According to data from ASISA, in 2011, the median living annuity policy had a drawdown rate of between 7.5 percent and 10 percent per annum before costs, and an average drawdown rate of 9.05 percent annually.[21] Accounting for costs can add up to three percentage points to these drawdown rates (National Treasury, 2012: 21). Drawdown rates at these levels expose living annuitants to the risk of falling income in real terms and a substantial reduction in their living standards, especially in later retirement years. The fall in real income occurs when the drawdown rates consistently exceed the growth generated by the underlying investment portfolio, thereby depleting the underlying investment capital. It is noteworthy that these drawdown rates over the last couple of decades have occurred despite declining interest rates and poor equity returns (National Treasury, 2012: 23).[22]

A guaranteed annuity could provide a solution to the difficult decision of choosing an optimal drawdown rate, because a sustainable level of income that a retiree can afford is guaranteed, given the retiree's initial level of retirement capital, age and gender.

According to a model developed by National Treasury (2012: 22) to understand the implications of these drawdown rates, there is an estimated probability of 67 percent that the income of a randomly-selected living annuitant will fall by 30 percent in real terms over his/her lifetime. In addition, for an individual between the ages of 65 and 70 years, with an annual drawdown rate of between 7.5 percent and 10 percent, there is an estimated probability of 80 percent that their real income will fall by 30 percent. Although the model is based on various assumptions,[23] these outcomes suggest that many South African living annuitants are at risk of falling real income during retirement (National Treasury, 2012: 22).

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[21] According to data from Alexander Forbes (2011), the average drawdown rate in their Member Watch sample of retirees had increased from just over eight percent (before fees) annually in 2007 to about 11 percent per year (before fees) in 2011. This is substantially higher than the average annual drawdown rate of 9.05 percent (before fees) reported by ASISA for 2011 (National Treasury, 2012: 23).

[22] It appears that many living annuitants do not review their drawdown rates (National Treasury, 2012: 25).

[23] Drawdown rates remain constant throughout, irrespective of age, and the standard Actuarial Society of South African mortality tables apply. An annual inflation rate of six percent, an annual real interest rate on bonds of two percent, an annual equity risk premium of four percent, an annual standard deviation of equity returns of 25 percent and an investment strategy of 50 percent in bonds and 50 percent in equity apply.

2.3.1.2 Investment/market risk

The second red flag recognised by National Treasury concerns the *investment (or market) risk* living annuitants personally bear, as they are entitled to choose and vary the unit trust funds[24] underlying the investment portfolio. At the present time (January 2021), there is no enforceable limit to the equity allocation within the investment portfolio, which potentially exposes the annuitant's retirement capital to significant market volatility and possible permanent losses. Market losses may reduce the living annuitant's underlying investment capital, based on which the annual pay-outs are calculated. Hence, market losses are usually reflected in the annual pay-out and may result in falling income over time, especially if the annuitant lives for a very long time.

2.3.1.3 Obligation of living annuitants to review decisions

The third red flag documented by National Treasury relates to the *obligation of living annuitants to make and continually review decisions* that involve difficult trade-offs, including how much income to withdraw (subject to the annual limits), what underlying unit trust funds to invest in[25] and which insurance or asset management company to choose.

Economists generally believe that individuals are better off when offered more choices (Markus & Schwartz, 2010: 344). However, when such individuals do not have the knowledge to make choices that are in their own best interest, increasing the number of choices does not necessarily leave them better off (Bodie, 2003: 26). The wide array of choices, as well as the shift of responsibility and risk towards the living annuitant, may also result in choice paralysis (De Beer, 2015: 3). Sub-optimal decision-making and choice paralysis are exacerbated in circumstances where the decision-making responsibilities are shifted to a surviving spouse, who may be ill-equipped to make such decisions, as he/she may never have been involved in financial decision-making before. Notwithstanding the specific circumstances of the annuitant, these decisions can become especially difficult to make in very old age, or in cases where the annuitant's health is steadily deteriorating (James & Oldfield, 2006: 2). Such circumstances could necessitate family members to intervene, which is oftentimes undesirable.[26]

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[24] Potentially also including individual shares, ETFs or other investment instruments.

[25] Even though there are many investment portfolios available, ASISA found most living annuities to be invested in similar portfolios (National Treasury, 2012: 19).

[26] Professional financial advisors that are sufficiently qualified should be able to assist individuals with such choices (Personal Finance, 2018a).

2.3.1.4 High costs of investing in living annuities

The fourth red flag acknowledged by National Treasury involves the *high costs*[27] *of investing in living annuities*. Living annuity costs have been estimated to represent up to 40 percent of the income that an annuitant, aged 65, withdraws from his/her living annuity, assuming a drawdown rate of five percent per year,[28] and annual fees of two percent per year. In present value terms, such fees could potentially shrink up to 20 percent of the underlying value of the living annuity over the annuitant's life (National Treasury, 2012: 5).

2.3.1.5 Sales incentives to promote living annuities

The fifth red flag highlighted by National Treasury refers to the *sales incentives among intermediaries*[29] *to promote living annuities*. The present value of commission earned by intermediaries for selling living annuities may be up to ten (10) times higher than what is earned on the life policy equivalent (National Treasury, 2012: 5).

2.3.2 Perspective on retirement policy reform

The annuity puzzle could hold important implications for public policy as well, as many countries around the world, including South Africa, are in the process of retirement reform (Brown, 2001: 31; De Beer, 2015: 186). Retirement reform is a process whereby government, through policies, seeks to encourage employees to save and provide adequately for retirement to ensure that they retire comfortably and have income that lasts for the rest of their lives (National Treasury, 2007: 4, 8).

Two retirement reform measures were introduced in South Africa, i.e. (i) retirement fund alignment, and (ii) the preservation of retirement fund benefits (Botha et al., 2017: 907, 937). Government is in the process of aligning the benefits of provident funds and provident preservation funds to those of pension, pension preservation and retirement annuity funds at retirement, in order to prevent individuals retiring from provident and provident preservation funds from spending their retirement assets too quickly and becoming excessively reliant on government or their families for financial support. This means that provident and provident preservation fund members will be required to convert at least two-thirds of their retirement savings into annuity income when they reach retirement, instead of a once-off large sum of cash. Vested rights with respect to provident fund values before the law changes will however enjoy protection (Botha et al., 2017: 907). The proposal to align retirement funds will ultimately lead to a larger group of people who must make an annuity decision at retirement. The new envisaged laws relating to the compulsory annuitisation of provident and provident preservation funds will take effect on 1 March 2021 (Momentum, 2019).

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[27] Living annuity costs are layered and may include commission paid to intermediaries, as well as fees charged for financial advice, administration and asset management (National Treasury, 2012: 17).

[28] In line with ASISA's standards for sustainable drawdown rates (ASISA, 2010).

[29] The intermediary corps of South Africa vary widely from opportunistic salespeople, to well-intentioned, but unqualified financial advisors, to well-intentioned and qualified financial advisors (Personal Finance, 2018b).

Many people change jobs a few times during their working lives. Every time employees change employment, they have an option to cash in their accumulated retirement savings, which ultimately leads to these individuals retiring with insufficient retirement benefits. Cashing in before retirement undermines the alleviation of poverty and increases financial reliance on government and others in old age. Employees may therefore withdraw their entire pension or provident fund savings in cash (with tax implications) when they resign or become retrenched. In terms of the envisaged preservation requirements, government seeks to encourage members of both pension and provident funds to preserve their savings with a financial institution, or old or new employer (with no tax implications) upon resignation or retrenchment. Only limited withdrawals will be allowed on new contributions made to pension and provident funds after the preservation requirement has become law.[30] The new preservation requirement will ultimately lead to a larger group of people who must make an annuity decision at retirement. The new envisaged laws relating to the preservation of pension and provident fund benefits have not yet been decided on (Botha et al., 2017: 937).

Government is considering several policy options to address the observed increase in living annuity demand (National Treasury, 2012: 36). The *first policy option* is to limit the choices available to retirees by reforming living annuities concomitant with the introduction of a new product, called a retirement income trust (RIT).[31] This new envisioned AIP will allow minimal or no investment choice and drawdown limits will most likely be age and capital dependent. Fees payable to intermediaries will be strictly regulated and could even be prohibited. Underlying asset restrictions may be more conservative than what is allowed under Regulation 28 of the Pension Funds Act (Republic of South Africa (RSA), 1956). At death, assets may or may not be bequeathable to nominated beneficiaries.

The *second policy option* involves retirement funds choosing a qualifying AIP as default at retirement, with longevity protection, thereby limiting the need for financial advice. In light of these options available to government, they are considering a three-tier structure for accumulated retirement balances: (i) the first one-third in cash (as is presently the case); (ii) the remaining two-thirds up to a threshold must be used to purchase a default product that contains some form of protection against longevity risk; and (iii) any remaining retirement capital may be used to purchase drawdown products such as RITs or reformed living annuities.

Since the publication of National Treasury's discussion paper (2012), new default regulations to the Pension Funds Act 24 of 1956 (RSA, 1956) have come into force with effect 1 September 2017. All retirement funds had to comply with the new default regulations by 1 March 2019. The new regulations aim to improve the outcome for members of retirement funds, by ensuring that they get good value for money and retire comfortably. According to Regulation 37, a retirement fund must

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[30] In terms of Section 1 of the Income Tax Act 58 of 1962 (RSA, 1962), retirement annuity funds, as well as pension and provident preservation funds already have a preservation element in that policyholders are normally not allowed to retire before the age of 55 years.

[31] Hybrids are also being considered.

make provision for at least one default investment portfolio. In terms of Regulation 38, a retirement fund must have a default in-fund preservation strategy for employees who leave the fund, prior to retirement. Regulation 39 provides for the establishment of a default annuity strategy by retirement funds, as well as the provision of retirement fund benefits counselling. The default annuity strategy can consist of either an in-fund[32] or an out-of-fund[33] annuity. In addition, the annuity strategy can involve living and/or guaranteed annuities. If the default annuity strategy should consist of a living annuity, four chosen underlying investment portfolios will have to comply with Regulations 28 and 37 of the Pension Funds Act 24 of 1956 (RSA, 1956). In addition, retirees' drawdown rates must comply with certain prescribed standards. In the case of an in-fund living annuity, or out-of-fund fund-owned living annuity policy, trustees have the responsibility to warn members if their drawdown rates are no longer sustainable. Trustees must ensure that all fees are competitive and reasonable, and that the default annuity strategy is reviewed at least annually. The default annuity will be opt-in instead of opt-out.

2.4 SOUTH AFRICAN ANNUITY OPTIONS AT RETIREMENT

An annuity refers to a series of payments at regular intervals, either made over the lifetime of the annuitant (i.e. a guaranteed annuity) or for a predetermined period (i.e. a fixed-term annuity). Members of retirement funds[34] are obligated by law to purchase a compulsory annuity[35] with at least two-thirds of their retirement capital to serve as a substitute for the salary income they received throughout their working lives. There are two types of compulsory annuities in South Africa, namely: (i) conventional/traditional guaranteed annuities, also referred to as annuitisation; and (ii) living annuities, also referred to as self-annuitisation or phased-withdrawal plans (Nienaber & Reinecke, 2009: 345-346).

South African legislation also allows retirees to follow alternative or mixed annuity strategies, which include blended/composite and switching annuity strategies. A blended/composite strategy refers to a portion of retirement capital invested in a guaranteed annuity and a portion invested in a living annuity. Switching strategies involve switching from a living annuity to a guaranteed annuity later in retirement. Guaranteed annuities are discussed in Section 2.4.1, whereas living annuities are discussed in Section 2.4.2 and hybrid annuities in Section 2.4.3.

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[32] Annuities are paid from the fund.

[33] An external provider, either in the name of the fund, or in the name of the individual member, provides the annuities.

[34] Pension funds, retirement annuity funds and pension preservation funds (Botha et al., 2017: 987).

[35] 'Compulsory' refers to the fact that the source of capital from which the annuity is purchased, is retirement fund capital. A voluntary annuity refers to an annuity purchased with discretionary (i.e. non-retirement fund) capital (Nienaber & Reinecke, 2009: 346).

2.4.1 Guaranteed annuities[36]

A guaranteed annuity is a contract between an insured person and an insurer that guarantees the payment of an income stream by the insurer for as long as the annuitant/insured is alive, in exchange for a non-refundable initial capital sum. The main characteristic of a guaranteed annuity is that it protects the annuitant against the risk of outliving savings in retirement, by pooling longevity risk across a group of annuity purchasers. Consequently, in return for a capital sum, the insurer assumes both the investment and the longevity risk (Nienaber & Reinecke, 2009: 347). Guaranteed annuities are typically marketed with features as given in Table 2.1.[37]

[36] Guaranteed annuities have a long history going back thousands of years. Its existence predates shares and bonds. Around 600BC, the Old Testament in 2 Kings, Chapter 25 makes reference to the guaranteed annuity that was granted to the king of Judah on his release from prison by the king of Babylon. The income from the guaranteed annuity was something arguably more reliable and useful than nominal cash or coin, since it was units of consumption in the form of daily bread immune to inflation and the risk of a debased currency.

Also, the English poet and author who lived in London, Geoffrey Chaucer (1343-1400), received in 1378 at the age of 35 a unique “life” annuity from King Edward III, 1 gallon of wine per day for the rest of his life.

Only in the 16th century did it become commonplace for life annuities to be paid exclusively in cash (Milevsky, 2013).

[37] Although different terms may be used, these features usually apply internationally.

Table 2.1: Guaranteed annuity features

Feature	Explanation
Guarantee term	Original payments are guaranteed to continue to a beneficiary for a fixed number of years from the start of the payments, whether the annuitant dies in that period or not. Guarantee terms are usually five (5) or ten (10) years. A guaranteed annuity with a guarantee term is more expensive than a guaranteed annuity without a guarantee term.
Single life	Payments will cease on the death of the annuitant.
Joint and survivor	The whole or a fraction of the payment is guaranteed to continue to a survivor, (e.g. the spouse) while that person is alive. Joint and survivor guaranteed annuities are more expensive than single-life guaranteed annuities.
Level	Payments stay fixed throughout the payment term, and do not keep pace with inflation. Level guaranteed annuities provide the highest income payment initially. Level guaranteed annuities are by far the most popular option in South Africa.
Escalating (fixed % or CPI)	Income payments escalate by a fixed percentage (usually five (5) percent) or with the consumer price index (CPI). Escalating guaranteed annuities are more expensive than non-escalating guaranteed annuities, i.e. you start off with a lower income payment as opposed to a non-escalating guaranteed annuity.
With-profit[38]	A portion of the initial capital is apportioned to a profit participation account. The lower the initial guaranteed payment chosen by the annuitant, the higher the increases that can be expected and *vice versa*. Payment escalation depends on the performance of the profit participation account. Once an increase has been granted, it becomes part of the guaranteed income payment.
Enhanced annuity for impaired lives[39]	A guaranteed annuity that pays out a higher pension to people who expect to have a shorter retirement than the average pensioner does. Risk factors considered to determine the guaranteed pension include occupation, income level, smoke status, past medical diagnoses, and present health status.

Source: Personal Finance, 2010.

It is possible to combine these features in various permutations. For example, suppose a hypothetical couple, a 65-year-old man and a 63-year-old woman purchase a level guaranteed annuity (joint and survivor 50%) with a ten-year-guarantee term. Suppose further that the insurer is willing to pay the couple R4 000 a month for a R1 000 000 premium/consideration. Should the couple become deceased before the guarantee term has expired, the beneficiary or beneficiaries on the policy will continue to receive the benefit until the ten-year-guarantee term has expired. Should the husband die within the ten-year term, his wife will continue to receive the full R4 000 per month until

[38] These products allow annuitants to receive a lifetime of income they cannot outlive, but also have the ability to earn market-linked returns. The annuity payment is adjusted in accordance with how its underlying investment portfolio performs, subject to a guaranteed minimum.

[39] It is offered by only a few providers, for example, Paramount Life and Just Retirement South Africa (SA). Just Retirement SA also offers a with-profits guaranteed annuity for impaired lives, where increases in guaranteed income are linked to the performance of an investment portfolio (Personal Finance, 2015).

the ten-year-guarantee term has expired, after which her monthly income payment will reduce to R2 000 per month until she dies. Should the husband die after the ten-year term, her monthly income payment will immediately reduce to R2 000 per month for her remaining life span. At the spouse's death at any time, the 50 percent survivorship benefit falls away immediately.

Adding benefits, e.g. a guarantee term, to a guaranteed annuity will reduce the income payment, because of reduced longevity pooling benefits. 'Longevity pooling' refers to insurance companies pooling annuity purchasers' money, where the money of those who die early is used to subsidise those who live long.

Brown (2007) highlighted the fact that people who purchase guaranteed annuities with guarantee terms are actually combining two different products: (i) a non-life contingent bond that pays interest plus capital over the guarantee period; and (ii) a deferred guaranteed annuity that will only start making payments after the guarantee term. Brown (2007) found it interesting that people would be willing to pay an insurance premium for product (i), because he is of the opinion that other investment alternatives, for example long-term bonds, could give equal or better results at comparable risk for the guarantee period.

Guaranteed annuity rates are dependent mainly on the following four factors (Personal Finance, 2010: 3):

i) **Gender**: Since the expected life span of a female exceeds that of a male, females will receive a lower pension than males of the same age.

ii) **Age**: The older the annuitant, the shorter his/her life expectancy and the higher the pension he/she will receive.

iii) **Choice of annuity and permutation**: A level annuity, for example, will provide the annuitant with a higher initial annuity compared to an inflation-linked annuity. Similarly, an annuity with a guarantee term will provide the annuitant with a lower annuity compared to an annuity without a guarantee term (See Table 2.1).

iv) **Interest rate at date of purchase**: The underlying assets of guaranteed annuities are usually fixed-interest government bonds. Consequently, guaranteed annuity rates are to a large degree dependent on interest rates; if interest rates are high, annuity rates offered on newly-issued annuities will be correspondingly high. Once issued though, the terms are fixed, and are not affected by any subsequent interest rate movements (Nienaber & Reinecke, 2009: 347).

2.4.2 Living annuities[40]

A living annuity[41] is defined in terms of Section 1 of the Income Tax Act 52 of 1962 (RSA, 1962), as the right of a member of a retirement fund to an annuity purchased at retirement from a life insurer or investment house. The annual amount of the annuity is limited to an income drawdown percentage between 2.5 percent and 17.5 percent of the underlying investment amount net of costs. This cap is an attempt to preserve capital and ensure a longer-lasting income. According to Government Notice 290 of 11 March 2009, the annuitant may elect a different income drawdown rate that will be applied on the revised fund value at the anniversary date of the annuity contract, provided it is within the set limits (SARS, 2009).[42] The life insurer or investment house does not guarantee the amount of the living annuity. On the death of the member, the underlying fund value may be paid to the nominee appointed by the living annuitant as an annuity or lump sum. Hence, the term 'living' refers to the fact that the capital lives on after the death of the annuitant. In the absence of a nominee, it will be paid to the deceased member's estate (Nienaber & Reinecke, 2009: 347-348).

The annuitant has the full flexibility to create a portfolio without having to adhere to the investment restrictions as described in Regulation 28[43] of the Pension Funds Act 24 of 1956 (RSA, 1956). Therefore, the entire portfolio could be invested in offshore or local equities if so desired.

ASISA's Standard on Living Annuities issued in 2010 (ASISA, 2010), warned that if exposure to offshore or local equities exceeds the restrictions contained in Regulation 28 of the Pension Funds Act 24 of 1956 (RSA, 1956), the annuitant may be at an even greater risk of losing capital and not maintaining current income levels.

Directive 135A, together with Directive 135 to the Long-term Insurance Act 52 of 1998 (RSA, 1998), provide an annuitant with an option to transfer his/her living annuity to another long-term insurer or investment house at his/her request, and to convert a living annuity to a guaranteed annuity. Once funds are transferred from a living annuity to a guaranteed annuity, this cannot be reversed. Purchasing more than one type of annuity may suit a retiree's needs and preferences at retirement. This would allow the retiree to utilise the different advantages that the various annuities offer.[44]

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[40] Living annuities have only been marketed in SA since the 1990s.

[41] Also referred to as an investment-linked guaranteed annuity (ILLA), flexible annuity, or linked annuity.

[42] In a bid to provide relief to those impacted financially by the COVID-19 pandemic, all living annuitants were able to either increase or decrease their annuity income rate to between 0.5% and 20% p.a. for a limited period from 1 June 2020 to 30 September 2020 (Prudential Investment Managers, 2020).

[43] In terms of Regulation 28 the following investment limits apply per asset class: 75% in listed equities, 25% in fixed property, 30% in offshore markets, with a further 10% allocation permitted within Africa (Moneyweb, 2018).

[44] One strategy a retiree could follow is to purchase a guaranteed (or life) annuity with a portion of his/her capital in order to cover basic living costs. The remainder of his/her capital could then be used to buy a living annuity in order to take advantage of possible capital growth, as well as to provide access to capital for emergencies. Switching from a living annuity to a guaranteed (or life) annuity either partially or in full could also be beneficial at a certain age (e.g. 75) should the retiree enjoy good health and wish to ensure that he/she

Living annuity policy holders who have a policy value of R125 000 or less can withdraw the full amount as a cash lump sum effective 1 June 2020[45] (Prudential Investment Managers, 2020).

Providers of member-owned annuities do not have to determine who the dependants of the annuitant are. The member-owned annuity product providers only have to pay the benefits to a nominee, or failing which, to the annuitant's deceased estate. Providers of fund-owned annuities must distribute the remaining balance in the living annuity to the deceased's dependants and nominated beneficiaries in accordance with Section 37C[46] of the Pension Funds Act 24 of 1956 (RSA, 1956) (Botha et al., 2017: 988).

The income from a living annuity is dependent on the length of the annuitant's lifespan, the income drawdown rates and the actual investment performance. Investing in a living annuity compared to a guaranteed annuity has many advantages.

For example, living annuities provide greater liquidity, participation in capital market returns, possibly higher consumption while alive, and the chance of bequeathing assets in the event of early death. Unfortunately, these advantages afforded to annuitants invested in living annuities, in comparison to conventional guaranteed annuities, come at a price. Annuitants fully shoulder the investment risk. It also offers no longevity pooling; therefore, the retiree might run out of assets before his/her death (Nienaber & Reinecke, 2009: 347-348). Nevertheless, over the last couple of decades its popularity has risen significantly in South Africa (Goemans & Ncube, 2008: 3).

2.4.3 Hybrid annuities

There are also hybrid annuities, which combine a living annuity and a with-profit guaranteed annuity in one product. In March 2017, Sygnia launched a hybrid annuity: the Sygnia ForLife annuity, is in essence a living annuity, but includes a lifetime income fund as a united asset class within the underlying investment portfolio. The product was developed after Sygnia actuaries developed a retirement income frontier to construct optimal investment strategies at retirement for individuals based on their preferences for two competing retirement goals, i.e. (i) preferences for lifetime spending and liquidity, as well as (ii) an inheritance to heirs at death (Anderson & Empedocles, 2016). The proportions invested in traditional asset classes and the lifetime income fund depend on the individual circumstances and goals of the client (Moneyweb, 2017).

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earns a sustainable income for the rest of his/her life, without the burden of volatile investment returns and uncertainty.

[45] Previously, According to Government Notice 31554 of 30 October 2008, should the value of assets from which an annuity is derived fall below R50 000, where a cash commutation was taken at the time that the annuity was effected, or R75 000 where no cash commutation was taken, the annuity could have been commuted in full (SARS, 2008). The commutation applied per transferring fund (Glacier, 2018).

[46] Retirement fund trustees have full discretion as to the allocation of remaining living annuity benefits to dependants and/or nominees as they deem fair, on the death of the annuitant.

Examples of other hybrid annuities that have been launched since 2014 include: (i) Glacier's Investment Linked Lifetime Income Plan; (ii) Discovery's Guaranteed Escalator Annuity; and (iii) Alexander Forbes' Lifestage Annuity, which switches your capital into a guaranteed annuity at a certain time. It seems that hybrid annuities have not been very popular so far, perhaps due to the difficulty of deciding which portion and when to switch to a guaranteed annuity, as well as the high cost associated with guarantees (Personal Finance, 2017). Figure 2.2 summarises the different South African retirement income options.

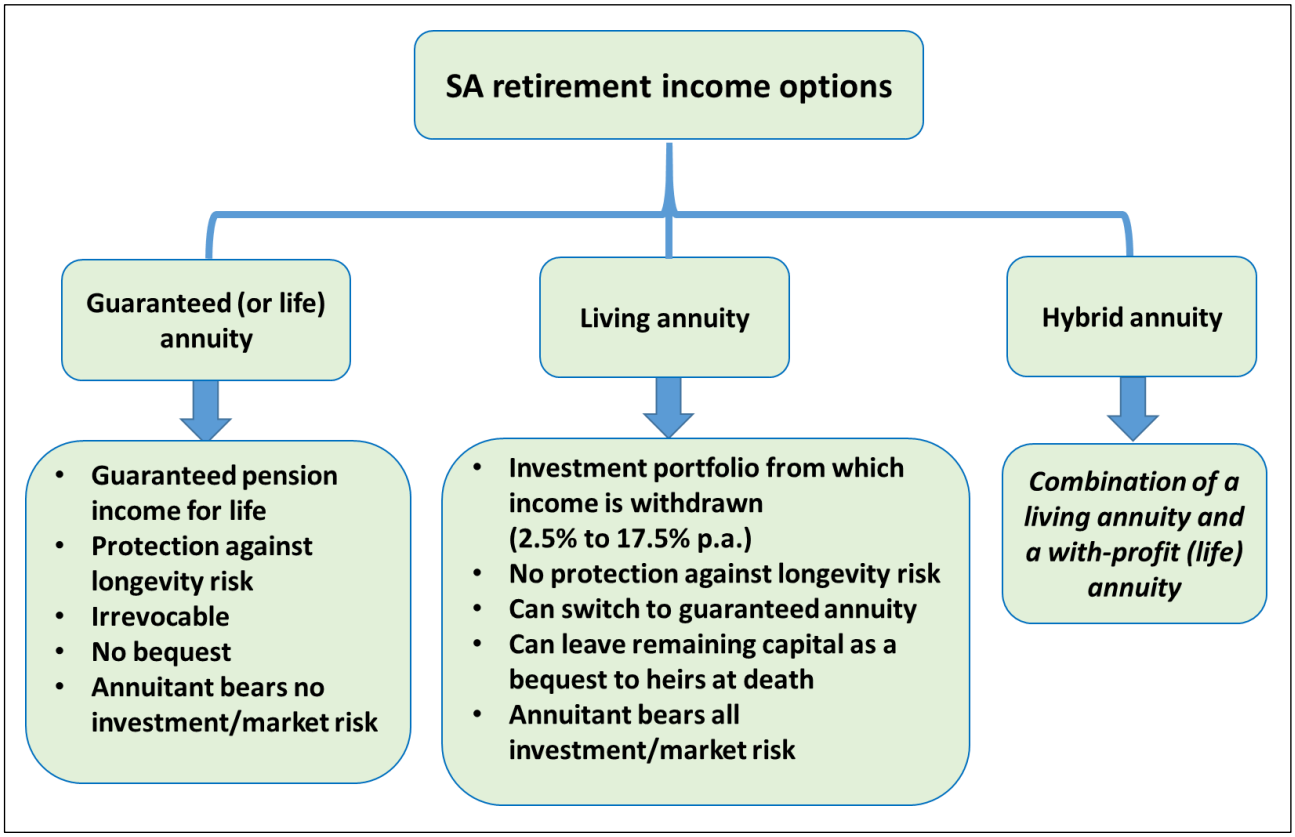

Figure 2.2: The different SA retirement income options

Source: Author's conception.

2.5 SUMMARY

This chapter provided a theoretical outline for annuities with a brief summary describing the legislation that governs retirement funds and annuity options in South Africa. Several concerns were raised regarding the increasing demand for living annuities that could affect retirement income security among retirees in old age. Also, a perspective on retirement income and fund reform in South Africa was given. Of note, the realignment of retirement funds will result in more people who will be confronted with making an optimal annuity choice in the future. In the next chapter, decision-making theory is discussed, with the view to better understanding the conscious and unconscious forces that are associated with decision-making.

CHAPTER 3:
DECISION-MAKING THEORY

3.1 INTRODUCTION

This chapter provides an overview of how decision-making theory has evolved over time, as people's decision-making behaviour with respect to AIPs is under investigation in this dissertation. Section 3.2 makes a distinction between decision-making theories that follow a normative versus a descriptive approach. Section 3.3 introduces the major model of rational decision-making under risk or uncertainty, namely expected utility theory. Section 3.4 presents behavioural models as an alternative to the rational model. Section 3.5 describes the choice paradox that often manifests in decision-making. Section 3.6 follows with a brief summary of the ongoing debate about the role of the mind, society and behaviour in decision-making. Finally, Section 3.7 presents a model for consumer behaviour. The chapter concludes with a summary in Section 3.8.

3.2 NORMATIVE VERSUS DESCRIPTIVE MODELS

Decision-making theory consists of two approaches: (i) a normative approach, and (ii) a descriptive (or positive) approach. In normative decision-making theory, the goal is to determine the optimal choice among choices, given a certain set of constraints. The normative approach thus assumes rational decision-makers who consistently choose the best option out of alternatives. The descriptive approach, on the other hand, is concerned with how people actually arrive at their decisions in real life (Simon, 1959: 253-283).

In normative terms, the rational model of decision-making under risk[47] or uncertainty[48] is derived from the logical analysis of games of chance, as opposed to the psychological analysis of value and risk, as descriptive models suggest (Kahneman & Tversky, 1986: 251). Joseph Schumpeter contrasted the normative and descriptive approaches eloquently in his book, *History of Economic Analysis*, stating that it "has a much better claim to being called a logic of choice, than a psychology of value" (Schumpeter, 1954: 1058). Also, Simon argued that economists studying the normative model of decision-making have generally been more concerned about how people ought to behave, and less about how they actually do behave (Simon, 1959: 254).

Normative models applied in decision-making theory therefore assume an idealised decision-maker that chooses rationally. On the contrary, descriptive models seek to describe people's actual behaviour and acknowledge that they are often irrational and prone to cognitive biases in their decision-making. It follows that a normative model is prescriptive – it serves to guide decision-makers, whereas a descriptive model seeks to explain human behaviour.

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[47] Probabilities of outcomes are well defined (Samuelson & Zeckhauser, 1988: 8).
[48] Subjective probabilities are assigned to outcomes (Samuelson & Zeckhauser, 1988: 8).

Decision-making theory developed over time and emerged from different schools of economic thought, as is graphically illustrated in Figure 3.1. Normative theories of decision-making emanate from the classical and neo-classical economic schools of thought, whereas descriptive or positive theories of decision-making originate from behavioural economics (Van Doornen, 2017).

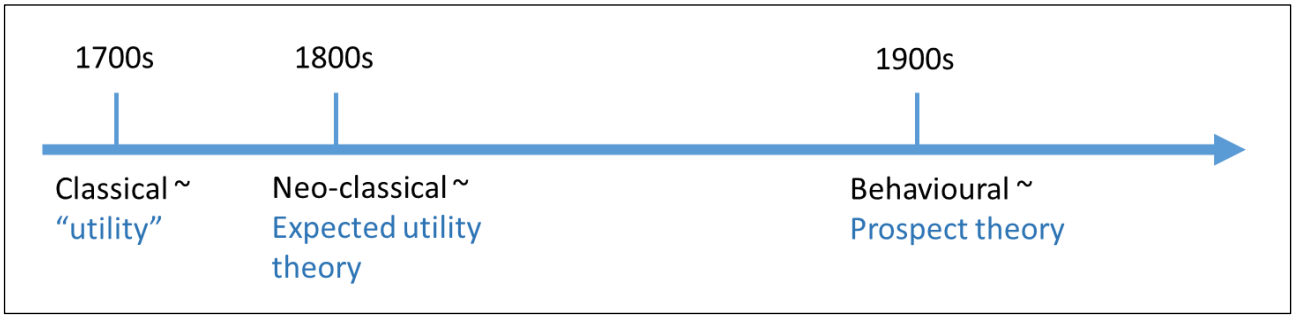

Figure 3.1: Economic schools of thought and decision-making theory timeline

Source: Derived from Van Doornen, 2017.

In the present study, a descriptive approach was followed, as the factors that relate to annuity perceptions, intention and satisfaction, were determined.

Next, in Section 3.3, the major theory of rational choice, namely expected utility theory, is introduced.

3.3 EXPECTED UTILITY THEORY

In the classical period of economics, micro-economist, Adam Smith, proposed in his book, *The Theory of Moral Sentiments*, that individual behaviour is linked to psychological explanations, including concerns about fairness and justice. According to Smith, even though individuals are motivated by self-interest, they are also benevolent in their passion to the plight of others (Smith, (1759: 9-13).

Also, Jeremy Bentham, founder of utilitarianism, introduced the principle of utility, a concept grounded in psychology, according to which the rightness or wrongness of an action depends on its consequences. In this way, actions are approved if they increase the likelihood of pleasure and happiness and reduce the likelihood of pain and unhappiness. Equally, actions are rejected if they increase the likelihood of pain and unhappiness and reduce the likelihood of pleasure and happiness (Bentham, 1789: 7).

During the neo-classical period, economists sought to restore economics as a natural science, and introduced the concept of *homo economicus*, or economic man, who is consistently rational and self-interested, and who pursues his/her subjectively-defined ends in an optimal way. In 1738, Daniel Bernoulli published a paper, *Exposition of a New Theory on the Measurement of Risk*, in which he defined a utility function (Bernoulli, 1954).

Expected utility theory was later formalised by Von Neumann and Morgenstern in their book, *Theory of Games and Economic Behavior* (Von Neumann & Morgenstern, 1944). Expected utility theory is

still considered as one of the major theories used in the analysis of decision-making under risk or uncertainty (Kahneman & Tversky, 1979: 263). The underlying premise of expected utility theory is that individuals share the central goal to seek pleasure and avoid pain. Every choice or action can henceforth be considered through its pleasure or pain giving properties, where pleasure is regarded as giving positive utility and pain as giving negative utility (Edwards, 1954: 382).

3.3.1 The expected utility function

According to the theory of expected utility, individuals aim to maximise their expected utility by choosing the strategy that yields the highest expected utility. The expected utility of any specific action/strategy is calculated by summing the weighted utility for each possible outcome multiplied by the probability of its occurrence.

The formula for an individual's expected utility for any given action/strategy, is as follows:

$$E[u(x)] = p_1.u(x_1) + p_2.u(x_2) + \cdots \quad (3.1)$$

Where:

E = the calculation of an expected utility for choosing any specific strategy/action

x_i = a possible outcome

u = the subjective weighted utility obtained from the occurrence of outcome "x_i"

p_i = the probability of x_i occurring

Expected utility theory is based on the premise that individuals are rational decision-makers who will consistently choose the best option out of alternatives with the view to maximise gain or utility (Von Neumann & Morgenstern, 1944: 8-45).

3.3.2 The basic tenets underlying expected utility theory

Expected utility theory is based on the following four major tenets:

i) **Invariance.**[49] If the principle of invariance is adhered to, decision-makers will choose the same option according to their preferences, irrespective of how the choice problem is presented.

ii) **Dominance** (also referred to as completeness). Dominance refers to the decision-maker's ability to rank alternatives with the view to choose the highest utility maximising option based on his/her unique set of preferences. For instance, a decision-maker either prefers option A to option B, or option B to option A, or is indifferent between option A and option B.

[49] Also referred to as extensionality (Arrow, 1982).

iii) **Transitivity**. Transitivity of preferences in expected utility theory rests on the premise that when the decision-maker prefers option A to option B, and option B to option C, option A will also be preferred to option C.

iv) **Cancellation**. In expected utility theory, any choice or action that yields the same outcome as another choice or action, is eliminated or cancelled. Cancellation is based on the arguments that: (i) only one choice or action will eventually be realised; and (ii) there is only a decision to be made between different choices or actions if such choices or actions yield different outcomes.

Invariance and dominance serve as the most compelling cornerstones of rational-agent models (Kahneman & Tversky, 1986: 252-254).

3.3.3 Shortcomings of expected utility theory

From early on it became evident that the tenets underlying expected utility theory are violated by real decision-makers in practice. For example, the Allais paradox initiated by Maurice Allais (1953) showed an inconsistency of actual observed choices with the predictions of expected utility theory. Also, psychologists, such as Daniel Kahneman and Amos Tversky, began to compare their cognitive models of decision-making under risk or uncertainty to economic models of rational behaviour.

However, arguments exist to support the use of normative models to explain actual behaviour, namely: (i) people are generally believed to be effective in pursuing their goals, especially in the presence of incentives and the opportunity to learn from previous experiences – it therefore seems reasonable to describe their choices as utility maximising; (ii) competition favours rational decision-making as a person's very survival depends on it;[50] (iii) the axioms on which these theories are founded, exhibit intuitive appeal and therefore should be able to account for real behaviour.

However, as posed by Kahneman and Tversky (1986: 252), despite these arguments, normative choice theory models cannot be reconciled with descriptive theory of decision-making, since:

> *The deviations from actual behaviour from the normative model are too widespread to be ignored, too systematic to be dismissed as random error, and too fundamental to be accommodated by relaxing the normative system.*

There is a large body of evidence in which individual behaviour deviates from the prescriptions of expected utility theory. Although rational economic models of decision-making remain a valuable starting point in understanding the forces that relate to people's choices, it proves troublesome to explain people's behaviour with respect to their decision-making in real life. In order to address the shortcomings of the rational model of decision-making to account for real choices, behavioural

[50] Rational behaviour among the few may also encourage rational behaviour among the many.

economics (as introduced in Section 3.4) has set the path for alternative models of risky choice to emerge, with the main goal to explain the observed violations of expected utility theory.

As the low rate of annuitisation contradict prescriptions by normative expected utility hypotheses, it is essential to look to behavioural factors that potentially relate to individuals' annuity perceptions, intention and satisfaction.

3.4 BEHAVIOURAL ECONOMICS

Behavioural economics is a relatively new inter-disciplinary field of study often regarded as the intersection between economics and psychology, and is based on the premise that individuals are prone to cognitive biases (that they are largely unaware of), which result in irrational decision-making. Cognitive biases occur due to the influence of psychological, cognitive, emotional, cultural and social factors on individual decision-making (Samson, 2015a: 12).

Behavioural economists have identified various cognitive decision-making biases by conducting experimental studies. These biases are considered irrational anomalies in the traditional model of expected utility. Prospect theory,[51] for example, demonstrates the influence of perceptions and judgments on people's preferences and subsequent choices. Four cognitive biases, namely: (i) loss aversion and (ii) the endowment effect (Section 3.4.1); (iii) risk orientation (Section 3.4.2); and (iv) framing effects (Section 3.4.3) have been regarded as some of the major contributions of prospect theory. In Section 3.4.4 to Section 3.4.6 other choice biases that seek to inform the theory of choice on how people actually make decisions, are presented.

3.4.1 Loss aversion and the endowment effect

According to loss aversion (also referred to as the reflection effect), people tend to overvalue losses relative to comparable gains, given a certain reference point. Consequently, a person's response to a loss is more extreme than their response would be to an equivalent gain. If losses hurt more than gains satisfy, it can be concluded that people hate to lose more than they like to win.

Loss aversion results in the endowment effect, according to which people place a higher value on objects that they currently possess compared to similar objects that they do not possess. This suggests that the satisfaction of acquiring something new is less than the pain would be to lose current possessions of comparable value.

The endowment effect, which stems from prospect theory's loss aversion, therefore refers to the overvaluation of current possessions (Thaler, 1980: 43). The endowment effect is present if people demand more to give up an object than they would be willing to pay to acquire it. The endowment

[51] Developed by Kahneman and Tversky (1979) in response to supporting evidence of inconsistencies of decision-making with the basic tenets of expected utility theory. It has been regarded as a leading alternative to expected utility as a theory of choice with uncertain outcomes (Levy, 1996: 179).

effect is closely related to the *status quo* bias[52] and the concept of inertia (or apathy) (Samson, 2015b: 35; 43).

Substantial experimental evidence of the endowment effect exists, including:

- Knetsch and Sinden (1984). Repondents from Group 1 were given a lottery ticket that they could redeem for $3, and the respondents from Group 2 were given $3. Later, the two groups of respondents had the chance to switch their lottery ticket for money and *vice versa*. Very few respondents from Group 1 initially endowed with a lotterly ticket, were willing to give it up (only 18%). A larger proportion of respondents (38%) from Group 2 were willing to give up their money to acquire a lottery ticket. The prize was a bookstore voucher worth $70 or $50 in cash.
- Knetsch (1989). Respondents from Group 1 (mug owners) were given a mug and asked if they would like to exchange their mug for a candy bar. Group 2 (candy owners) were asked if they would like to exchange their candy bar which they received intially for a coffee mug. The respondents from Group 3 were offered the choice of receiving either a coffee mug or a candy bar. Whereas about half of the respondents in Group 3 chose a coffee mug and the other half a candy bar, only a fraction of the respondents in Group 1 and 2 were willing to give up their initial endowment to exchange it for the other.
- Kahneman, Knetsch and Thaler (1991). Group 1 (sellers) were given coffee mugs and asked if they would be willing to sell the mugs. Group 2 (buyers) were given the equivalent amount of money and the option to buy mugs. Group 3 (choosers) were asked if they would like to receive a mug, or the equivalent amount of money. The resultant low trade volume was due to the reluctance of respondents in Group 1 to part with their endowment. Also, Group 3 behaved more like buyers than sellers.

The endowment effect, stemming from loss aversion, is inconsistent with the assertion of completely reversible indifference curves, as assumed by traditional choice models (Knetsch, 1989: 1282). Reversible indifference curves mean that if an individual owns A, and is indifferent between keeping it and trading it for B, such individual should also be indifferent about trading it for A, if he/she owns B. If the endowment effect is present, however, such reversibility no longer holds (Kahneman et al., 1991: 196). According to Knetsch (1989: 1282), indifference curves may be even less reversible if people were asked in a more natural setting to give up their own original endowment that they have acquired with considerable effort and where the symbolic value of what they have acquired is quite high.

Exchanging or giving up a large amount of money at retirement for an income stream of payments, may induce the endowment effect. This cognitive bias could therefore potentially explain why so few people avail themselves of the benefits provided by guaranteed annuities. In addition, it may also

[52] A preference for the current state (Samuelson & Zeckhauser, 1988: 7).

possibly in part explain the bequest motive, according to which annuitants do not want to give up their retirement capital at death.

3.4.2 Risk orientation

Risk orientation refers to people's tendency to exhibit risk-averse behaviour with respect to gains, and risk-seeking behaviour with respect to losses.

Substantial experimental evidence of risk orientation exists, including:

- Kahneman and Tversky (1979)[53]. Repondents were given two options: An 80% chance to lose 4 000 or a sure loss of 3 000. The majority of respondents preferred the risk of 80% to lose 4 000, above a sure loss of 3 000.
  Also, in another experiment, respondents were presented with option A: Obtaining 2 500 with a probability of 33%, 2 400 with a probability of 66% or 0 with probability of 1%. In option B, 2 400 could be obtained with certainty. The majority of respondents chose option B.
- Kahneman and Tversky (1986). Respondents were given two scenarios to choose from, as follows: In Scenario 1 respondents could choose between a sure gain of $240 or a 25% chance to gain $1 000 and a 75% chance to gain nothing. In Scenario 2 respondents were given the option to choose between a sure loss of $750 or a 75% chance to lose $1 000 and a 25% chance to lose nothing. The majority of respondents in Scenario 1 were risk-averse and chose the sure gain. The majority of respondents in Scenario 2 were risk-seeking and were willing to take the chance (with a probability of 75%) to lose $1 000.
- Quattrone and Tversky (1988). Two groups of respondents were asked by two economists to choose between two political candidates, namely A and B. For the respondents in Group 1, economist 1 predicted that under candidate A's reign, inflation will be either 14% or 16%, and under candidate B's reign, inflation will be either 4% or 26%. Both economists predicted the inflation for other nations to be 24% or 26% (reference point). The respondents in Group 2 got the same cover story, but the reference point was altered to 4% and 6%. The majority of Group 1's respondents chose candidate A, and the majority of Group 2's respondents favoured candidate B.

These experiments where respondents exhibited risk-averse behaviour when choices involved gains, and risk-seeking behaviour when choices involved losses, illustrate violations of both invariance and dominance.

As retirees may fear losing their retirement capital in the event of early death (as is the case with a guaranteed annuity), they may be willing to bear more risks, in the form of investment and longevity risk, in their endeavour to prevent such loss of capital from occurring. This behavioural bias could

[53] The currency in both experiments refers to the Israeli currency.

explain why most people prefer not to annuitise their retirement capital, thus choosing a living annuity, resulting in the remaining retirement capital at death living on and which can be bequeathed to heirs. The risk orientation bias could manifest even more in the presence of risk-order bias, which stems from the availability heuristic, according to which people place a higher likelihood on events (in this case early death) that are more easily imagined, opposed to, for example, a very long retirement (See also Section 4.2.10).

3.4.3 Framing effects

Framing refers to the influence of how a choice problem is worded or framed on people's decision-making. Framing effects influence behaviour more when the choice problem is complex and difficult (Samson, 2015b: 32-33).

Substantial experimental evidence of the framing effect exists, including:

- Kahneman and Tversky (1986). The respondents of Group 1 were asked to choose between two programmes to combat the outbreak of an Asian disease that could kill 600 people. If programme A is adopted, 200 people's lives will be saved. If programme B is adopted, there is a 1/3 probability that all the people will be saved, and a 2/3 probability that no people will be saved. As the outcomes were positively framed (saving lives) the respondents acted risk-aversely and the majority of respondents chose option A. The respondents of Group 2 were given the same cover story but with the following options: If programme C is adopted 400 people will die; if programme D is adopted, there is a 1/3 probability that nobody would die and a 2/3 probability that everyone will die. The majority of respondents favoured programme D, therefore exhibiting risk-seeking behaviour. The options given to the first and second group of respondents are essentially the same; they differ only in how the choices are framed (lives saved versus lives lost).
- Kahneman and Tversky (1986): In another experiment, the respondents of Group 1 were asked to choose between two outcomes assuming they were $300 richer at the time. They had to choose between a sure gain of $100 or a 50% chance to gain $200 and an equal chance to gain nothing. The respondents of Group 2 were asked to make a choice between two outcomes assuming they were $500 richer at the time: a sure loss of $100 or a 50% chance to lose nothing and an equal chance to lose $200. The majority of respondents from Group 1 were risk-averse in choosing a sure gain of $100. In contrast, the majority of the respondents from Group 2 were risk-seeking in choosing a 50/50 chance to lose nothing or $200. Their results showed that preferences were more sensitive to changes in wealth in the form of gains and losses from a certain reference point, as opposed to states of wealth, as implied by the rational model. Therefore, people think in terms of gains and losses relative to a reference point, rather than absolute outcomes. The notion that the primary carriers of value are changes in assets rather than asset positions, is a central assumption of prospect theory.

- McNeil, Pauker, Sox and Tversky (1982). In an experiment, respondents were asked to imagine they had lung cancer and had to choose between two types of therapies based on possible outcomes. Therapies were either labeled as surgery and radiation, or as A and B. Both groups were given cumulative probability and life expectancy data. For Group 1 the two options were described using the mortality frame (probability of dying). For Group 2 the two options were presented using the survival frame (probability of living). Respondents' choices between a preferred medical treatment were affected by the frame in which they were presented. For example, surgery was less attractive when presented in the mortality frame (radiation was preferred 42% of the time) than in the survival frame (radiation was preferred 25% of the time).

These studies demonstrate that a change in frame can result in a change in preferences regardless of the fact that all the parameters of the decision problem remain the same. These preference reversals are inconsistent with the invariance axiom of expected utility theory.

Presenting annuity options at retirement using the investment frame, which focuses on the risk/return features of the product, as opposed to a consumption frame, which focuses on guaranteed consumption for life, could account for the low uptake of guaranteed annuities.

3.4.4 Availability heuristic and risk-order bias

The availability heuristic refers to people making judgments about the likelihood (frequency and probability) of an event based on how easily it comes to mind (Tversky & Kahneman, 1974: 1127; Samson, 2015b: 28). Risk-ordering bias, stemming from the availability heuristic, refers to retirees placing too much weight on the probability of dying early (i.e. overweighting the probability of near periods that are more easily imagined), relative to the probability of a long retirement (i.e. underweighting the probability of events in the distant future that are not easily imagined) (Gazzale & Walker, 2009).

Experimental evidence of the availability heuristic includes the following:

- Tversky and Kahneman (1973). Respondents were asked if it is more likely that a word starts with "k" or where "k" takes the third position in a word (the same was asked of four other consonants). Their hypothesis was that people would base their answer on the ease with which instances come to mind, as it is much easier to come up with words starting with a "k" compared with "k" in the third position of a word. In a typical text, the consonant "k" appears about twice as much in the third position, as opposed to the first. It was also established in an extensive word count that all of the five consonants appear more frequently in the third as opposed to the first position (Mayzner and Tresselt, 1965). Tversky and Kahneman's hypothesis was confirmed as the majority of respondents judged the first position of the letter "k" as the most frequent.

- Tversky and Kahneman (1973). In another experiment respondents were given a list of names from a recording they had to listen to, consisting of both famous people (e.g. Elizabeth Taylor) and less famous people (e.g. Lana Turner). Respondents were then given the task to recall and write down the names. As expected, respondents recalled the names of famous people, which are more easily recalled, better than the names of less famous people.
- An (2008). By conducting telephone interviews with respondents in an experiment, it was shown that individuals with a higher recall of advertisements about antidepressants, estimated the prevalence of depression to be higher, than those with a lower recall of such advertisements.

Risk-ordering bias could explain why most retirees prefer a lump sum to an income stream of payments, as the risk of an early death seems more likely than the risk of outliving one's assets.

3.4.5 Mortality salience

Mortality salience, derived from terror management theory,[54] refers to the anxiety and fear (or terror) experienced when people become aware of their inevitable and impending death (Greenberg, Solomon, Pyszczynski & Lyon, 1989: 681).

This fear of death may cause two defence mechanisms, namely: (i) denial or avoidance; and (ii) the pursuit of symbolic immortality. As a first defence,[55] people deny or avoid facing their mortality by supressing such thoughts with distractions or by denying their vulnerability and thereby pushing death into the distant future. As a second defence,[56] people pursue symbolic immortality by becoming part of something larger than themselves, a so-called eternal universe, consisting of families, churches and organisations, which form part of the whole.[57] In this way one's life is seen as meaningful, valuable and everlasting (Pyszczynski, Greenberg & Solomon, 1999: 839-843).

Contemplating the purchase of a guaranteed annuity may increase mortality salience, defined as the increased accessibility of death-related thoughts, as retirees are forced to think about their own longevity/mortality, i.e. how many years they have left to live. This in turn may result in retirees avoiding guaranteed annuities, and rather managing their retirement monies themselves. The effect of mortality salience on respondents' preference against guaranteed annuities was demonstrated by Salisbury and Nenkov (2016) in four experimental studies.

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[54] Terror management theory was developed by Jeff Greenberg, Sheldon Solomon, and Tom Pyszczynski and expanded in their 2015 book, *The Worm at the Core* (Greenberg, Solomon & Pyszczynski, 2015). The concept derives from the work of Ernest Becker, whose 1973 book, *The Denial of Death*, argued that the majority of human actions are undertaken primarily as a means to ignore or evade death (Becker, 1973: ix).

[55] A.k.a. a proximal defense.

[56] A.k.a. a distal defense.

[57] This supports the bequest motive and hence a preference for the living annuity option.

i) In the first experiment, respondents were asked how likely they are, at age 65, to put their accumulated retirement savings into a guaranteed annuity versus a phased withdrawal product. Respondents were also asked about their thoughts whilst contemplating their choice. Only 1% of the respondents who chose to manage their retirement monies themselves (63.38% of the sample) had spontaneous death-related thoughts. In contrast, 40% of the respondents who chose a guaranteed annuity (36.62% of the sample), reported that they had death-related thoughts. The evidence supported their prediction that a choice including a guaranteed annuity evokes death-related thoughts, which in turn decreases the likelihood of choosing such product.

ii) The second experiment followed the same process as the first with one distinct difference: Respondents from Group 1 were first asked to write about dental pain, whereas the respondents from Group 2 were asked to write about their own death. Among those who wrote about their own death, only 23% chose a guaranteed annuity, whereas 41% of those who wrote about dental pain chose the guaranteed annuity option. Deductively, an increase in mortality salience decreases the likelihood of respondents choosing the guaranteed annuity option.

iii) The third experiment built on the first two experiments with one distinct difference: The description of a guaranteed annuity was altered by replacing: “each year you live” for Group 1 with “each year you live until you die” for Group 2 and “if the annuity holder lives up to different ages” for Group 1 with “depending on the age when the annuity holder dies” for Group 2. The respondents from Group 2 were more mortality salient, i.e. they had more death-related thoughts and were therefore less likely to choose the guaranteed annuity option. This experiment also illustrates the effect of framing on decision-making.

iv) Lastly, in the fourth experiment the researchers replicated their study in a real-life setting that reflected what consumers may encounter in practice. The sample was close to retirement age. Specifically, they found that increasing mortality salience with explicit reference to their own death, decreased the proportion of people who were likely to choose the guaranteed annuity option.[58]

By performing a meta-analysis to derive an overall size effect across these four experiments, the robustness and consistency of Salisbury and Nenkov’s (2016) findings were confirmed.

[58] A contrary argument is that the denial of death could lead to an increase in guaranteed (or life) annuity purchases when longevity expectations are optimistic (Salisbury & Nenkov, 2016: 69). Similarly, one could also argue that the denial of death could have a decreasing effect on living annuity purchases, as the risk of outliving retirement capital rises with optimistic longevity expectations.

3.4.6 Status quo bias

To do nothing is within the power of all men – Samuel Johnson (Boswell, 1993).

In decision-making, one of the options is often to do nothing, or to maintain one's current position. The *status quo* position often prevails out of convenience, habit, inertia (or apathy), policy, tradition, fear, conservatism, or rationalisation. The *status quo* effect can be even more pronounced in real life as opposed to a laboratory setting for the following reasons: (i) the person might have lived with the *status quo* for a long time; (ii) the person's past choices may be known to others; (iii) the person's decision may affect others; (iv) the person might not know that there is a decision to be made; (v) the person may not be able to recognise alternatives.

In various experiments conducted by Samuelson, Zeckhauser and Neipp, evidence is given of the *status quo* effect, as follows:

- Samuelson and Zeckhauser (1988). In an experiment no neutral setting, or *status quo* position is defined for Group 1. The respondents were given a hypothetical scenario of inheriting a sum of money which they must now invest in a high risk company, a moderate risk company, treasury bills, or municipal bonds. Respondents from Group 2 were given the same cover story with one distinction. One of the options were positioned as the *status quo*, as follows: a significant proportion of the sum of money is invested in a moderate risk company. Their results showed that an option became much more popular when it was designated as the *status quo*. Also, preference for the *status quo* increased as the alternatives increased.
- Neipp and Zeckhauser (1985). In a field experiment they found evidence of *status quo* inertia as the health plans chosen by old Harvard employees differed significantly from the plans chosen by new enrollees who were free from *status quo* bias as they chose their health plans from a neutral setting. Old employees persisted with their original choice. They also found evidence of a very low rate of transfers between health plans among employees.
- Samuelson and Zeckhauser (1988). Members of the Teachers Insurance and Annuity Association of America College Retirement Equities Fund (TIAA-CREF) must each year divide their contributions between the TIAA fund, consisting mostly of bonds, and the CREF fund, consisting mostly of shares. In a study by the TIAA (1986),[59] evidence was found of the *status quo* bias as older members more frequently stuck with their initial allocation originally selected for the long term.

The following rational explanations are given by Samuelson and Zeckhauser (1988) to explain the *status quo* effect: (i) the decision maker's preferences and choice set remain the same; (ii) the cost of switching exceeds the benefit of choosing a superior alternative; (iii) uncertainty about the increased utility from choosing an alternative option; (iv) the high cost of undertaking a decision

[59] As reported on by Samuelson and Zeckhauser (1988).

analysis. Since many of the explanations, including transaction costs and uncertainty, were not present in the experiments conducted above, rational explanations for the *status quo* effect seem to be inadequate.

The *status quo* bias may also be explained by non-rational factors, including: (i) the endowment effect stemming from loss aversion; (ii) framing effects; (iii) anchoring;[60] (iv) sunk costs;[61] (v) regret avoidance;[62] (vi) the drive for consistency;[63] and (vii) feeling in control.

The *status quo* bias may explain why retirees would rather keep their retirement money in the same form as they had it pre-retirement, therefore preferring the living annuity, to the guaranteed annuity alternative.

In the next section it is revealed that in decision-making, wellbeing is not necessarily increased with an increase in choices. Standard dogmas are challenged by relating the arguments to the annuity choice of either a living or guaranteed annuity.

3.5 THE CHOICE PARADOX

The official dogma deeply embedded in modern affluent Western industrialised societies is that freedom and autonomy maximise individual welfare. According to psychology theory, more choices give people freedom and autonomy. Deductively, more choices lead to an improvement in wellbeing. This rough syllogism rests on the premise that choice enables each person to pursue precisely the object or activity that best satisfies his/her preferences within the limits of his/her resources (Markus & Schwartz, 2010: 344).[64]

Markus and Schwartz (2010: 351) argued that freedom, autonomy, choice and wellbeing need not necessarily flow from the other and are not inevitably linked. They pose the following as a basis for their argument.

Firstly, choice enhances the importance of the *individual's contribution to the outcome*, i.e. people are responsible for unfavourable outcomes. This in turn fosters self-blame[65] and even depression

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[60] Initial exposure to a number serves as reference point and influences subsequent judgments about behaviour (Samson, 2015b: 28).

[61] According to the sunk cost fallacy, individuals continue their behaviour as a result of the time, money and effort invested prior to choosing the current option (Samson, 2015b: 45).

[62] Kahneman and Tversky (1982: 160) argued that individuals feel stronger regret about decisions with unfavourable outcomes as a result of action taken, as opposed to inaction.

[63] According to cognitive dissonance theory, individuals find it difficult to hold two conflicting states simultaneously and therefore seek cognitive consistency.

[64] However, this model only holds if an independent model of the self is assumed (where the self is seen as a separate whole, such is more prevalent in Western cultures). This is in opposition to an interdependent model, where choices that highlight one's autonomy are less significant than choices that highlight one's relationships with others (one's duty, connection, and obligation to others, which is more prevalent in East-Asian cultures).

[65] This anomaly is in line with regret aversion as modelled in regret theory (Bell, 1982). According to regret theory, decision-makers may learn that the outcome of a different choice may have been preferable, which may result in a feeling of regret. Bell proposed that regret-averse decision-makers may be willing to trade off

(or suicide) when an outcome does not meet expectations. In this way, financial advisors are required by law to explain the many alternative annuity income options to their clients, accompanied with the benefits and risks of each option. As the final choice and subsequent risks are shifted from the expert to the client (as in many other domains), the client carries the burden of making a suboptimal or wrong choice.

Secondly, people may experience *cognitive dissonance* when faced with many choices that express their individual preferences. Cognitive dissonance refers to the anxiety experienced over the correctness of a choice, and the ensuing fear to be viewed as an incompetent and irrational chooser. South African retirees may therefore be reluctant to annuitise, as the choice is irreversible.

Thirdly, choice overload can produce *choice paralysis*, which debilitates rather than liberates. Notwithstanding the many decisions living annuitants must continually make in retirement that involve difficult trade-offs, it is doubtful whether the scope of such future decision-making is recognised at the outset.[66] On the other hand, purchasing a guaranteed annuity involves making various final and irreversible choices initially, with respect to, *inter alia* guarantee terms and payment escalation. In this way, due to choice paralysis, self-annuitisation could be favoured over annuitisation, as the decision-making with respect to the future allocation of investment funds, withdrawal rates, and so forth, could be postponed and re-visited at a later stage.

Fourthly, choice overload can lead to *dissatisfaction* with even a good choice, as attractive features of many possible alternatives are rejected. The South African retirement income landscape offers individuals many choices. When annuitants choose a specific AIP, they necessarily reject many alternatives. Similarly, with many choices comes the *escalation of expectations*. This may lead to dissatisfaction with one's choice, since the best outcome one can hope for is for one's high expectations to be met. With fewer choices, people have lower expectations and hence the possibility of being pleasantly surprised exists (Schwartz & Ward, 2004: 96).

These behavioural phenomena highlight the difficulty people experience in making choices. In fact, Schwartz, Ward, Lyubomirsky, Monterosso, White and Lehman (2002) found that these choice difficulties will be experienced and felt even more by decision-makers who are maximisers, as opposed to satisficers. Maximisers seek to choose the best option and will exhaustively seek out and compare all options, where satisficers are satisfied in choosing a good enough option and will stop searching for alternatives upon reaching an acceptable option. Schwartz et al. (2002) found that maximisers have higher expectations, are more likely to compare themselves with others, are more sensitive to regret and are generally more disappointed with their choices.

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financial gain in order to avoid regret. Bell introduced a multi-attribute utility function to better fit observed behaviour, compared with its expected utility theory counterpart.

[66] If retirees were fully aware of the magnitude of decision-making required by self-annuitising, they would have been more inclined towards annuitising their retirement capital.

It is evident from the psychology and social science literature that some choice is better than no choice, but it does not follow that more choice is necessarily better. It follows that a good life requires some constraints, whether imposed by the self, the state or other institutions (Markus & Schwartz, 2010: 352). Hence, as National Treasury is considering various policy options to address their concerns regarding the growing demand for living annuities, limiting the number of choices individuals are required to make at retirement, may not only be to the benefit of retirees, but also to society as a whole.

In the next section the role of and connection between the mind, society and behaviour in decision-making are discussed.

3.6 THE ROLE OF THE MIND, SOCIETY AND BEHAVIOUR IN DECISION-MAKING

Standard economic models mostly assume that people consider all possible costs and benefits from a self-interested perspective and then make a thoughtful and rational decision. Although this approach has merits, it ignores the psychological and social influences on behaviour. According to empirical findings from studies on human decision-making from many disciplines, including psychology, behavioural economics and sociology, decision-making is oftentimes influenced by the way in which an individual processes information, the community in which he/she operates, as well as the mental models used. According to the *World Development Report: Mind, Society, and Behavior*, human decision-making rests on three principles, i.e. (i) automatic thinking;[67] (ii) social thinking; and (iii) thinking in mental models (World Bank, 2015: 1-4).

In *automatic thinking*, a problem is viewed through a narrow frame, where the individual's belief system, assumptions about the world and intuition fill in any missing information. Alternatives are evaluated based on associations that effortlessly come to mind. Conversely, in deliberative thinking, problems are viewed through a wide frame where many factors are considered via effortful reasoning and reflection (Kahneman, 2003). By viewing the annuity choice through the investment lens,[68] living annuities are superior by way of potentially generating above-average returns. In contrast, from a risk perspective, guaranteed annuities could be viewed as unfavourable since annuitants' money is relinquished to the insurance company in the event of death.

According to the principle of *social thinking*, individuals are social animals who are concerned with and associate with each other, and are thus influenced in their decision-making by the norms and preferences of their social networks and peer groups (World Bank, 2015: 9). Therefore, retirees could base their choice of an AIP on what others around them choose.

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[67] In direct opposition to deliberate thinking.

[68] If the consumption frame were adopted, retirees would view guaranteed annuities as superior to living annuities, as consumption is guaranteed without the risk of outliving retirement capital.

Thinking in mental models refers to the social beliefs and practices (or culture) that people draw from their communities. Cultural beliefs help people to understand the world and their place in it, and are hence deeply rooted in decision-making (World Bank, 2015: 11). By thinking in mental models, people view themselves as part of something larger, e.g. a family, a wider group or institution, and ultimately as a member of society. When making choices, they will carefully consider their place in the group, institution, or society. In addition, they will seek to further the interests of the group or institution, rather than solely their own narrower self-interest. They will strive to act like someone in their position in society is supposed to, or what their culture expects from them.

Embedded in AIP decision-making is the implicit and explicit inter-generational contracts about the duty of help, care and inheritance. In some cultures, the children assume this duty, and the family members thereby share their resources. Should there be a deficit to care for the retiree, the family members earning an income will provide. Conversely, should there be a surplus once the retiree has passed away, the family members will inherit. In this particular social context of deciding how to convert pension savings into an income, AIP decision-making will lean towards self-annuitisation in order to optimise the whole family unit's wellbeing.[69]

In other cultures it may not be expected that children should have financial claims or responsibilities towards their families once they have left home. According to this cultural belief system, everybody should look after their own needs and decide how they will provide for themselves. In these specific circumstances, retirees may be more prone to annuitisation.[70]

Paying attention to how humans think (the processes of the mind) and how history and context shape thinking (the influence of society) can improve the design and implementation of policies and interventions that target human choice and action (or behaviour). It can provide the direction for new approaches to understanding behaviour and designing and implementing policy.

In the next section, a model for consumer behaviour is presented by relating it to the choice of either a living or a guaranteed annuity.

3.7 CONSUMER BEHAVIOUR

Consumer behaviour as a field of study is, among others, concerned with activities associated with the selection, purchase, usage and disposal of goods or services, as well as the effect of the consumer's mental or cognitive processes, emotional state and behavioural responses preceding and following such activities. It emerged in the 1940s and 1950s as a sub-discipline of marketing. In essence, consumer behaviour examines how emotions, attitudes and preferences affect

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[69] In the event of living annuity capital becoming depleted, income earning family members will support the retiree. Conversely, should the retiree pass away soon after retirement, family members will inherit any remaining living annuity capital.

[70] The retiree will secure the highest guaranteed pension for the rest of his/her life.

purchasing behaviour. As a discipline, consumer behaviour stands at the intersection of economic psychology and marketing science (Kardes, Cronley & Cline, 2011: 13).

Consumer behaviour in the context of choosing between a set of products is more complex in real life than merely evaluating the attributes of alternatives and rationally selecting the one that best solves a clearly recognisable need for the least amount of money. As illustrated in the conceptual model of consumer behaviour in Figure 3.2, individuals develop self-concepts and subsequent lifestyles based on internal and external influences. These self-concepts and lifestyles produce needs and desires, many of which require decisions to satisfy certain consumption needs. As individuals encounter a particular situation, the decision process is activated. The decision process, as well as resulting experiences and acquisitions, in turn influence the consumers' self-concept and lifestyle through their effects on internal and external characteristics.

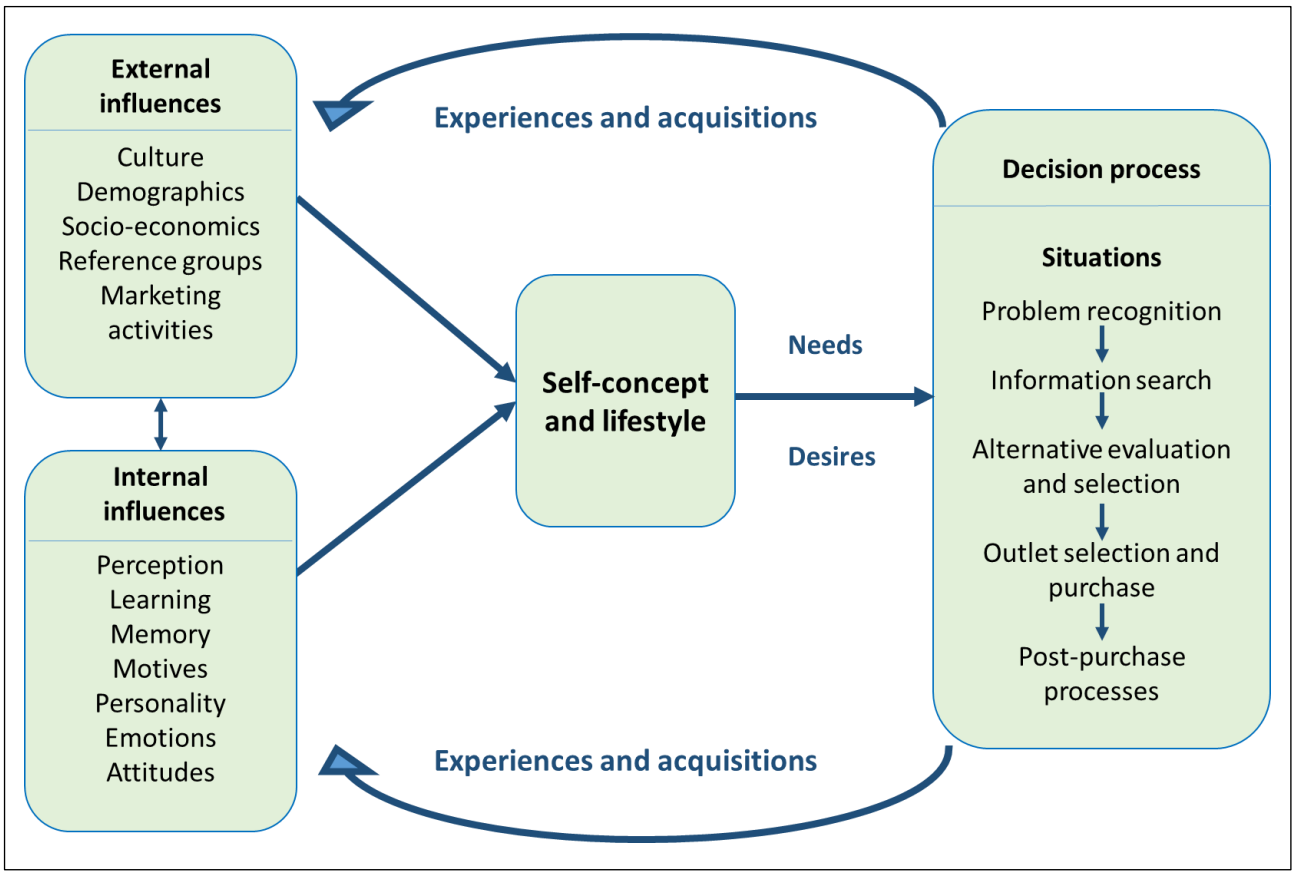

Figure 3.2: Model of consumer behaviour

Source: Derived from Hawkins and Mothersbaugh, 2013: 25.

With respect to external influences, individuals from different cultures and subcultures may follow different consumption patterns.[71] Differences in consumption patterns may lead to some consumers favouring a certain AIP to another. In addition, demographic characteristics (e.g. age, wealth, income, occupation, relationship status, family situation and household size) may vary widely among consumers and will affect their behaviour with respect to preferring a certain AIP to another. If consumers belong to a certain group in society, or have regular interactions with such a group, it may also influence their decision-making in terms of their choice between alternative retirement income strategies. Moreover, marketing activities within the financial industry may play an important role in a consumer's propensity to annuitise, or not.

Internal influences involve how individuals perceive information regarding different retirement income options, for example. Perception is usually followed by learning, where subsequent changes in the content and structure of long-term memory occur.[72] Consumer behaviour is also affected by other internal influences, for example, an individual's motivations, his/her personality, as well as his/her emotions. In this way, individuals will have certain motivations/reasons for choosing a specific AIP, based on their perceptions, personality and emotional state, among other factors. An individual's attitude towards annuitisation relates to an enduring manifestation of the interaction among motivational, emotional, as well as cognitive processes with respect to retirement income options, for example.

Due to the interaction between the internal and external variables as illustrated in the conceptual model of consumer behaviour in Figure 3.2, individuals develop a self-concept that mirrors their lifestyle. An individual's current and desired lifestyle may culminate in his/her specific need and desire to convert accumulated retirement savings into a steady income stream of payments.

The decision-making process, as it relates to the choice between AIPs to meet consumers' desire for a steady income stream of payments for his/her remaining life span, is composed of a sequence of activities as illustrated in Figure 3.2 and explained as follows:

The context or situation within which the decision-making takes place, must be considered. In the context of this study, the consumers have the task of converting accumulated retirement capital into an income stream of payments in order to maintain their living standards.

Problem recognition, the first step in the decision-making process, relates to a discrepancy between a consumer's desired state and actual state. Without this discrepancy, there is no need to start the decision-making process. In the context of this study, the consumer must convert an accumulation of retirement capital (actual state) into an income stream (desired state) by making a choice between various AIPs.

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[71] Differences in consumption patterns and subsequent behaviour may occur because of differences in value systems.

[72] Learning could also occur via external influences.

The information search stage of the decision-making process involves (i) determining appropriate evaluative criteria for the assessment of the possible solutions to a problem; (ii) identifying various alternative solutions; and (iii) assessing how each alternative solution performs according to the evaluative criteria. In Table 3.1 the best performer relative to each evaluative criterion is given for two retirement income solutions.

Table 3.1: The relative performance of AIPs

Evaluative criteria	Solution 1: Living annuity	Solution 2: Guaranteed annuity
Flexibility and control	Outperforms	
Remaining capital to heirs	Outperforms[73]	
Protection against longevity risk		Outperforms
Protection against investment risk		Outperforms
Liquidity	Outperforms	
Continuous decision-making and involvement		Outperforms[74]

Source: Author's conception.

'Alternative evaluation and selection' refer to the consumer's choice and may have already taken place in the previous step, namely information search. Rational choice theory suggests that consumers have the skill and motivation to find the optimal solution to a problem, notwithstanding situational factors (Schwartz et al., 2002: 1178). However, consumer decisions in real life may be complex, disorganised, organic, non-conscious, circular, emotional and incomplete, rather than simple, structured, conscious, mechanical and linear as the conceptual model in Figure 3.2 suggests.

In order to make a choice, the consumer must decide on the relative importance of each criterion. Evaluative criteria are usually associated with a specific benefit. For example, the need for flexibility and control (see Table 3.1) enables the living annuitant to choose, among others, underlying investments/funds, as well as a withdrawal rate (subject to the annual limits).

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[73] It should be noted that the living annuity alternative will only outperform if there is a positive net value in the living annuity account at death. Dying with a positive net value in one's living annuity account cannot be guaranteed, but only hoped for. A combination of low investment returns, high withdrawal rates, and pensioners living longer, may lead to the underlying funds getting depleted. In such circumstances, instead of inheriting the remaining living annuity capital, heirs involuntarily acquire the duty of supporting their parents financially in their old age as a moral responsibility.

[74] The guaranteed (or life) annuity outperforms, as it involves no further decision-making and involvement after retirement. Positioning retirement savings in a way that requires continual decisions about investments and withdrawal rates could get more difficult as retirees age, especially for their surviving spouses. It should therefore be borne in mind that the initial attractiveness of flexibility and control (the first criterion) over retirement savings provided by a living annuity, could become onerous to retirees in the future.

Before a marketing manager or public policy decision-maker can develop a sound strategy to affect consumer decisions, the following must be determined: (i) the evaluative criteria consumers use; (ii) how consumers perceive the various alternatives as solutions; and (iii) the relative importance of each criterion.

'Outlet selection and purchase' refer to the retail outlet selected to make a purchase. For example, respondents may choose Liberty, Sanlam or Old Mutual to purchase a guaranteed annuity, or Allan Gray, Investec or Coronation to purchase a living annuity. Although the outlet selection is not under investigation in this study, it should be noted that in purchasing an AIP, this step may come much earlier. In this way, the consumer's first step may be to select a specific financial advisor. In what follows, the process commences by searching for information, evaluating and selecting an optimum from the alternatives presented by the financial advisor.

Post-purchase processes include post-purchase evaluation and customer satisfaction. Purchase is followed by use, evaluation, and in some cases, satisfaction. Consumer responses to satisfaction include repurchase, positive word-of-mouth and loyalty. Immediately following a purchase, consumers may feel doubt or anxiety, also known as post-purchase dissonance. Post-purchase dissonance is a function of the degree of irrevocability of the decision, the difficulty of choosing among alternatives, and the individual's tendency to experience anxiety. Dissonance could occur especially in the case of high-involvement, high-impact and complex decision-making, where difficult trade-offs exist between alternatives. Satisfaction with a purchase decision is mainly a function of the initial performance expectations and perceived performance, relative to those expectations (Hawkins & Mothersbaugh, 2013). In this study, the satisfaction levels of retirees with respect to the eventual outcome of their decision to choose any specific AIP were ascertained.

3.8 SUMMARY

Chapter 3 provided an overview of how decision-making theory has evolved over time. Some of the major decision-making models were introduced that follow either a normative or descriptive approach. As the low rate of annuitisation contradicts prescriptions by normative expected utility hypotheses, it is essential to look to behavioural factors that potentially relate to individuals' annuity perceptions, intention and satisfaction.

Cognitive biases that could potentially explain the annuity puzzle include: (i) the endowment effect according to which people find it difficult to part with retirement capital in exchange for an uncertain income stream; (ii) risk orientation, which refers to retirees' risk-seeking behaviour and willingness to shoulder investment and longevity risk in an effort to avoid losing retirement capital should death occur unexpectedly early; (iii) viewing annuitisation through the investment frame as opposed to the consumption frame; and (iv) overweighting the likelihood of an early death, as opposed to a long retirement.

Behavioural models provide a framework to better understand the role of the unconscious in individual decision-making behaviour. Bringing awareness to the unconscious forces that drive decision-making, empowers individuals in making choices that are in their best interest over the long term.[75] Certain choice paradoxes in decision-making were described, followed by a summary of the ongoing debate about the role of the mind, society and behaviour in decision-making. The chapter concluded with a model for consumer behaviour. Reference was made throughout to show how these theories relate to the annuity choice that is under investigation in this dissertation. In the next section, both international and South African research findings attempting to explain the annuity puzzle are presented.

[75] As Carl Jung said: “Until you make the unconscious conscious it will direct your life and you will call it fate” (Psychology Today, 2019).

CHAPTER 4:
SOLVING THE ANNUITY PUZZLE

4.1 INTRODUCTION

This chapter gives an overview of research findings that have attempted to explain the annuity puzzle. Section 4.2 reviews international research on solving the annuity puzzle. Section 4.3 provides informal evidence on the factors that relate to annuitisation in South Africa. Section 4.4 investigates international empirical evidence on the many factors that influence the annuity choice. Section 4.5 explores two case studies where countries have experienced high annuitisation rates. Section 4.6 analyses research on the satisfaction levels of retirees as they relate to their annuity choice.

4.2 INTERNATIONAL EVIDENCE

One of the most puzzling contrasts between observed behaviour and the implications of standard economic theory is the fact that, globally, few retirees actually purchase guaranteed annuities.

According to the life-cycle model,[76] saving behaviour is governed by the individual's desire to smooth consumption patterns over his/her lifetime, within the constraints imposed by limited resources. The standard life-cycle model suggests that individuals in retirement will dis-save out of available resources as their life expectancies shorten.

In the classic research paper by Yaari (1965: 137), the first economist to add guaranteed annuities to the life-cycle model, he wrote:

> *One need hardly be reminded that a consumer who makes plans for the future must, in one way or another, take account of the fact that he does not know how long he will live. Yet, few discussions of consumer allocation over time give this problem due consideration.*

Yaari (1965) continued that rational consumers slowly draw on and spend their retirement wealth in proportion to their attitude towards longevity risk, gradually reducing their standard of living. He further stated that, if you give these same consumers the ability to purchase guaranteed annuities to insure or hedge themselves against longevity risk, they will not have to reduce their standard of living as they age. He showed that guaranteed annuities secure a higher level of consumption[77] compared with the investment alternative (a bond), if utility maximising consumers are concerned

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[76] As originally developed by Franco Modigliani and Richard Brumberg in the early 1950s (Modigliani & Brumberg, 1954).

[77] The higher income offered by a guaranteed annuity, often referred to as the mortality premium or mortality credit, was also confirmed by Brown (2007) when he compared the income streams from guaranteed annuities to alternative drawdown strategies while the annuitant is alive. This is because life annuitants give up their wealth upon death.

only about their own utility and have an uncertain date of death (This is possible as life annuitants who die early subsidise those who live long.) Deductively, guaranteed annuities increase consumption and eliminate risk. Yaari (1965) derived the optimal mix of a guaranteed annuity and a bond, as a function of an individual's preference for bequests versus consumption during his or her lifetime.[78]

Yaari concluded in his classic 1965 article,[79] that a life-cycle consumer with no bequest motive would always choose full annuitisation in the presence of actuarially fair annuity markets. The so-called Yaari life-cycle model continues to be the starting point for analysing annuity decision-making (Brown, 2001: 36).

Many variations on the standard life-cycle framework followed Yaari's model, but under different assumed model parameters. For example, Davidoff et al. (2005) more recently confirmed Yaari's result, under a significantly less restrictive set of assumptions. In particular, Davidoff et al. (2005) proved that full annuitisation is optimal in the absence of a bequest motive, even in the case of actuarially unfair annuity markets. Davidoff et al. (2005) further showed that, in an incomplete market setting, where the income stream provided by annuitisation does not sufficiently match a desired consumption path, it is still optimal to annuitise a substantial portion of one's wealth. They argued that this finding should hold, even in the presence of a bequest motive.

Despite the outcome predicted by the simple Yaari model, observed age-wealth profiles seem to be nearly flat in the USA (Friedman & Warshawsky, 1990: 135). Given the uncertain time of death, this reluctance to dis-save would be a natural consequence under Yaari's life-cycle model for risk-averse individuals in the absence of guaranteed annuities. Given the well-developed guaranteed annuity markets that exist, the challenge has been to explain why so few people avail themselves of the benefit of longevity insurance afforded by guaranteed annuities (Friedman & Warshawsky, 1990: 135-136).

In Franco Modigliani's Nobel Prize for Economics acceptance speech,[80] he said:

> *It is a well-known fact that annuity contracts, other than in the form of group insurance through pension systems, are extremely rare. Why this should be so is a subject of considerable current interest. It is still ill-understood. Adverse selection, causing an unfavourable pay-out, and the fact that some utility may be derived from bequest are, presumably, an important part of the answer.*

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[78] Yaari's 'optimal mix' of annuities was introduced only a few years after Harry Markowitz introduced 'asset allocation' (Milevsky, 2013: 71).

[79] Yaari's 1965 research paper is the most widely-cited research article in the guaranteed annuity economics literature (Milevsky, 2013: 70).

[80] Delivered in Stockholm, Sweden, 9 December 1985, as quoted by Rusconi (2006: 5).

The economic body of literature that seeks to solve the annuity puzzle within a rational framework has delivered valuable insights. However, these explanations at best reduce the demand for annuitisation and do not fully account for the low observed rate of guaranteed annuity uptake. As a result, it is necessary to move beyond the rational paradigm and into the study of human behaviour, to better account for the existence of the annuity puzzle. The scholarly literature that explored adverse selection, bequests, as well as other rational, neoclassical or normative[81] resolutions for the annuity puzzle, is summarised in Section 4.2.1 to Section 4.2.9. In Section 4.2.10 descriptive[82] or behavioural resolutions for the annuity puzzle are explored. All resolutions[83] are summarised in Table 4.1 at the end of the discussions, and categorised in two columns of literature either in support of or in opposition to the resolution.

4.2.1 Bequest motive

The bequest motive refers to the annuitant's desire to leave his/her remaining retirement capital to heirs at death.[84] When the retiree has all his/her resources in guaranteed annuities (without guarantee terms), there is no possibility of intergenerational transfers, even in the case of early death.[85]

There are competing schools of thought on the bequest motive as a possible explanation for the annuity puzzle. The literature is roughly split into studies conducted in terms of the life-cycle framework and studies that include empirical results.

Findings from research conducted in terms of the standard life-cycle model of utility maximisation, suggest that bequest motives can partly explain the limited uptake of guaranteed annuities, especially in later retirement years, in the USA, for example (Friedman & Warshawsky, 1988; 1990). Although Vidal-Meliá and Lejárraga-García (2006) found the bequest motive not to be a significant factor influencing the demand for guaranteed annuities for couples in Spain,[86] they found that very few married couples would be willing to purchase guaranteed annuities once they take the combined effects of market imperfections, the possibility of pre-existing annuities and the bequest motive into account.

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[81] It can serve as a guide to decision-makers.

[82] Indicates explanatory power.

[83] Milevsky (2013) identified approximately 2 000 research articles written in the past 50 years on annuities.

[84] This desire might have an altruistic or egotistical motivation, or a combination of both.

[85] Conversely, in a living annuity product, the size of the bequest will vary as a function of the timing of the annuitant's death. If the annuitant dies early after retirement, the bequest will be larger than if the annuitant dies at an advanced age. To diminish the variability of a planned altruistic bequest, Brown (2007) argued that retirees could give their family a certain amount at retirement as a gift. In this way, the bequest amount will not differ based on the timing of the annuitant's death. The remaining capital could then be used to purchase a guaranteed annuity to assure a certain level of consumption during retirement.

[86] In terms of a utility maximising life-cycle framework.

Vidal-Meliá and Lejárraga-García (2006) used annuity equivalent wealth (AEW), a utility-based measure, to ascertain how much additional wealth must be given to a couple with bequest motives, in the absence of guaranteed annuities to make them as well off as if they were fully annuitised. Purcal and Piggott (2008) found that, in terms of a utility maximising life-cycle framework, the bequest motive is the single strongest deterrent to guaranteed annuity purchases for the Japanese, followed by social security, and to a lesser extent, administrative loadings.

Empirically however, ownership of guaranteed annuities is rare, even among people who seem to have weak bequest motives. For example, Hurd (1987) found no empirical support for the existence of a bequest motive to explain the low rates of annuitisation among retirees who participated in the US Retirement History Longitudinal Survey (RHLS)[87] from 1969 to 1979.[88] Firstly, he found evidence of falling wealth with age as most of the elderly dis-saved as they became older. Secondly, he found that people with and without children had similar dis-saving behaviour in retirement.

In contrast, Bernheim (1991) came to a different conclusion and found empirical evidence, based on the same dataset as Hurd (1987), but focusing on the 1975 wave,[89] that the existence of a bequest motive is a deterrent for individuals to purchase guaranteed annuities. Bernheim (1991) presented the following reasons to explain this inconsistency with Hurd's result (1987): Firstly, Hurd's finding (1987) could be attributed to altruistic children providing their parents with a safety net, therefore eliminating the need for precautionary savings.[90] Secondly, childless people could desire leaving bequests to heirs that are not their children.

Similarly, research by Laitner and Juster (1996) pointed to the existence of bequest motives by employing 1988 survey data of the TIAA-CREF. Bequest motives were found especially in respondents with lower assessments of their children's earning potential, as well as those with a higher retirement-age net worth. In addition, they found that many retirees continued to save after retirement, and that some retirees without children intended to leave bequests. Also, respondents chose to add guarantee terms to their guaranteed annuities.

Conversely, Brown (2001) found no empirical evidence to support the notion that bequest motives are an important factor in explaining limited guaranteed annuity demand. Brown moved beyond simple simulations for hypothetical consumers by estimating the AEW measure for a sample of

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[87] The Longitudinal Retirement History Study (LRHS) is a 10-year longitudinal study to investigate the changes in the economic and social characteristics of US participants, as they entered retirement. Six waves of data were collected from a national sample of 11 153 persons aged 58 to 63 years. Baseline data was collected in 1969 and follow-up surveys were administered at two-year intervals in 1971, 1973, 1975, 1977, and 1979 (Hurd, 1987: 301).

[88] This result is also echoed by Hurd (1989) where he reported that the marginal utility of bequests is small.

[89] A wave refers to a specific year in which data was collected.

[90] As *quid pro quo*, such altruistic children could inherit their parents' remaining retirement capital (See also Section 4.2.5).

actual households in the first wave of HRS[91] data assembled in 1992 for individuals aged between 51 and 61 years. The HRS questionnaire asked these individuals what they plan to do with their DC account balances when they retire, and was not based on their actual decisions. To measure bequest motives, he used as proxies whether someone had children or not and the self-reported importance of leaving a bequest in general.

Kopczuk and Lupton (2007) found evidence of an egoistic bequest motive across all households employing 1995, 1998 and 2000 survey data from the Assets and Health Dynamic among the Oldest Old (AHEAD)[92] under a life-cycle model. An egoistic bequest motive arises from receiving utility from dying with a positive net wealth. They argued that 80 percent of the elderly households' net wealth in their sample will stay in a bequeathable form, and that half of this can be attributed to a bequest motive. They suggested that a bequest motive is largely due to the desire to die with a positive net wealth (in the face of an uncertain date of death), as opposed to the presence of children. In fact, they find little evidence to support an altruistic bequest motive.[93] They determined that the presence of children merely serves as an indicator of a bequest motive, as opposed to a deterministic predictor. They further argued that, although most of the population has a bequest motive, some bequests are merely accidental or unintentional, as opposed to strategically planned-for and intentional (Kopczuk & Lupton, 2007).

In the same vein, Lockwood (2012) provided empirical evidence, using the 2006 wave of US HRS data, that even modest bequest motives play a role in the limited demand for guaranteed annuities. The main variables used as proxies for bequest motives were similar to those used by Brown (2001). He concluded that, although many of the main estimates of bequest motives in the savings literature significantly reduce the predicted ownership of guaranteed annuities, it does not sufficiently explain the observed rates. Lockwood (2012) attributed the inconsistencies between Yaari's model and empirical results to: (i) the challenge of finding respondents with very low bequest motives; and (ii) the problematic proxies used to measure bequest motives. In this way, people without children do not necessarily have weak bequest motives, and the self-reported importance of bequests motives fails to identify especially weak bequest motives. He further noted that individuals would gain little from annuitisation, irrespective of their bequest motives, if they wished to view spending as having an opportunity cost that is not contingent on their own survival (Lockwood, 2012).

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[91] The Health and Retirement Study (HRS) is a longitudinal panel study that surveys a representative sample of approximately 20 000 people in the USA. The HRS is conducted by the Institute of Social Research at the University of Michigan. The first wave of HRS data assembled was in 1992 for individuals aged between 51 and 61 (with spouses of any age). Follow-up surveys are conducted every two years (Brown, 2001: 42).

[92] For US individuals born in 1923 or before (i.e. individuals older than 77 years in 2000), and spouses of any age.

[93] Also, Wilhelm (1996) found little support for a general altruistic theory for bequests, based on a US dataset on federal estate tax returns from 1980 to 1982.

Several other studies include empirical evidence that the bequest motive depresses guaranteed annuity demand. These studies are further elaborated on in other sections:

- Gardner and Wadsworth (2004) for the UK (See Section 4.4.2);
- Pashchenko (2010) for the USA (See Section 4.2.3);
- Ameriks, Caplin, Laufer and Van Nieuwerburgh (2011) for the USA (See Section 4.2.4); and
- Inkmann, Lopes and Michaelides (2011) for couples in the UK (See Section 4.4.6).

Several other studies include empirical evidence that the bequest motive is either inconclusive or insignicant in explaining the annuity puzzle. These studies are further elaborated on in other sections:

- Bütler and Teppa (2007) for Switzerland (See Section 4.4.5); and
- Cappelletti, Guazzarotti and Tommasino (2013) for Italy (See Section 4.4.3).[94]

In summary, based on evidence from life-cycle studies, as well as empirical results, the presence of a bequest motive seems at best to partly account for the low uptake of guaranteed annuities. In particular, the proxies used to test for bequest motives in studies that include empirical results prove inadequate. To this end, including a proxy to identify the presence of an egotistical bequest motive,[95] is key in deepening our understanding of this resolution.

4.2.2 Actuarially unfair annuity pricing

Actuarially unfair annuity pricing refers to the effect of loadings on the price of guaranteed annuities. Loadings arise from two sources, namely: (i) insurance companies taking “off the top” to account for administration costs[96] and profit; and (ii) adverse selection.[97]

Adverse selection or anti-selection, resulting from asymmetry of information, rests on the premise that annuitants have knowledge of their own mortality risk that insurers find impossible to obtain. Subsequently, individuals who expect to live for a long time choose to annuitise.[98] This in turn leads insurers to raise their prices to compensate them for the high longevity risk of purchasers, by decreasing the level of the monthly annuity pay-out offered for a given premium.

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[94] They used the presence of children as a proxy for a bequest motive.

[95] According to which an individual receives positive utility from dying with a positive net wealth in the face of an uncertain date of death.

[96] High guaranteed annuity costs may also be attributed to insurers’ inability to fully hedge longevity risk, due to the absence of an asset that has returns that are correlated with longevity risk, as noted by Blake and Turner (2014). The authors support governments issuing longevity bonds to serve as a hedge against such longevity risk.

[97] Ramsay and Oguledo (2018: 626) referred to self-selection instead, as they argued that insurers are aware of and can anticipate their consumers’ behaviour.

[98] This contrasts with Williams (1986) who conducted an experiment among 20 US graduate students who were asked if they would prefer a guaranteed annuity or a lump sum at retirement. In this experiment, longer life expectancies reduced the demand for guaranteed annuities. However, their impact was weaker than the effect of higher interest rates.

Various researchers worked in the context of the standard life-cycle model to investigate the extent to which adverse selection and other costs reduce the attractiveness of guaranteed annuities.[99] Notably, Friedman and Warshawsky (1988; 1990) found evidence in the USA that the lack of actuarially fair annuities explains the low participation rate. In the early years after retirement, the actuarially unfair cost of annuities appears to be sufficient explanation for the absence of participation in the guaranteed annuity market in the USA based on data from 1968 to 1983. However, they found that a combination of the cost of annuities and a positive bequest motive is necessary to provide an explanation for the phenomenon at older ages.

Other studies conducted in terms of a life-cycle framework that found support for actuarially unfair annuity markets as part of the explanation for the annuity puzzle, which are further elaborated on in other sections are as follows:

- Vidal-Meliá and Lejárraga-García (2006) for couples in Spain (See Section 4.2.1);
- Post, Gründl and Schmeiser (2006) for Germany (See Section 4.2.5); and
- Purcal and Piggott (2008) for Japan (See Section 4.2.1).

Mitchell, Poterba, Warshawsky and Brown (1999) revisited the attractiveness of guaranteed annuities by calculating the expected discounted present value (EDPV) of pay-outs for guaranteed annuities in relation to the premium cost[100] in the USA based on 1995 guaranteed annuity data. For a 65-year-old male, they calculated the after-tax money's worth ratio (MWR) to be .81 for males and .85 for females based on the general population mortality tables and using the Treasury yield curve as discount rate.[101] Mitchell et al. (1999) argued that annuity pricing is not sufficient to explain the low take-up because the money's worth of individual annuities is actually quite good and has significantly improved since the 1980s, in part due to the reduction in transaction costs over the period. It seems therefore, that the high costs inherent in guaranteed annuities are not sufficient to offset the gains from annuitisation.

Finkelstein and Poterba (2002; 2004) found evidence that the lack of actuarially fair annuities explains the lack of guaranteed annuity demand in the UK, by employing a similar methodology to that of Mitchell et al. (1999).

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[99] As guaranteed annuity purchases are irreversible and payments cease on the death of the annuitant, adverse selection has the effect of making such annuities especially unattractive to people in average or poor health (Ramsay & Oguledo, 2018).

[100] Also referred to as the money's worth ratio (MWR).

[101] The differences in the MWRs based on either the general population mortality tables or the mortality tables for life annuitants, suggest that the source of the price mark-up partly arises from the fact that mortality rates for life annuitants are substantially below mortality rates for the general population.

Shu, Zeithammer and Payne (2016) surveyed more than 600 respondents[102] between 45 and 65 years of age and employed a choice-based conjoint analysis in order to ascertain which guaranteed annuity attributes or consumer characteristics correlated with their willingness to consider guaranteed annuities. The researchers were specifically interested to measure which factors influenced the respondents' demand for a guaranteed annuity beyond its contribution to net present financial value (NPV).

Guaranteed annuity attributes included starting income, insurance company financial strength ratios, annual income increases, and period-certain guarantees. Guaranteed annuity attributes were given in two versions. In the first version, the attributes were merely listed, whereas, in the enriched version, illustrations were given of expected pay-outs if the annuitant should survive until certain ages. Consumer characteristics measures included the amount saved for retirement, subjective life expectancy, numeracy and perceived fairness of guaranteed annuities.

One consumer characteristic that stood out, is respondents' sensitivity to fairness.[103] In the survey, a series of questions were developed to test respondents' sensitivity to fairness in various economic scenarios. Those respondents who were the most sensitive to unfairness, rejected a guaranteed annuity, despite being offered favourable terms where guaranteed annuity income payments exceeded their contribution or premium. Shu et al. (2016) concluded that these respondents feel that it is unfair for a life insurance company to keep the excess funds should the life annuitant die unexpectedly early.

In summary, based on results from studies conducted to investigate the role of unfair annuity pricing to explain the annuity puzzle, the presence of high costs associated with guaranteed annuities due to adverse selection, profit taking in imperfect markets, as well as transaction or administration costs could potentially justify the observed low demand for guaranteed annuities. To what extent it explains the puzzle seems to depend on the specific market. In addition, the perceived fairness of guaranteed annuities seems to be an important piece of the puzzle deserving due consideration.

4.2.3 Pre-annuitised wealth

Pre-existing annuitisation refers to the part of retirees' wealth that is already annuitised with exposure to, for example, social security payments and DB pension pay-outs. Pashchenko (2010) examined a variety of explanations, including pre-annuitised wealth, minimum annuity purchase requirement, illiquidity of housing wealth, and bequest motives, for the low levels of annuitisation in the USA. She

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[102] They recruited participants through a commercial platform on Qualtrics, a survey software program.

[103] Other attributes that consumers also value or gain utility from beyond its contribution to the guaranteed annuity's NPV are inflation protection, added guarantee terms, providing cumulative pay-out information, as well as good insurance company credit ratings. Finally, preference for a guaranteed annuity had a significant positive correlation with numeracy skills, but were unexpectedly negatively correlated with higher retirement savings (Shu et al., 2016).

concluded that pre-annuitised wealth has the largest quantitative contribution to the annuity puzzle using HRS data for the cohort aged 65 to 75 in 1998 (wave 4).

Dushi and Webb (2004) moved beyond life-cycle simulations, and empirically showed, by calculating utility-based measures, that much of the failure of the average retired US household to annuitise can be attributed to the high proportions of their wealth that are pre-annuitised. They used household data from the AHEAD and HRS (waves 2 to 5)[104] cohorts (Dushi & Webb, 2004).

Bütler, Peijnenburg and Staubli (2014) provided empirical evidence of pre-annuitised wealth as a hindrance to annuitisation based on Swiss data consisting of 22 000 individual annuitisation decisions from various pension funds from 1996 to 2006.[105] They suggested that most industrialised countries provide a level consumption floor in old age, usually in the form of means-tested benefits or income supplements, the availability of which creates an incentive to cash-out occupational retirement fund benefits for low- and middle-income earners, instead of taking out a guaranteed annuity.

Other studies conducted in terms of a life-cycle framework that found support for pre-annuitised wealth as part of the explanation for the annuity puzzle, which are further elaborated on in other sections are as follows:

- Brown and Poterba (2000) for the USA (See Section 4.2.5);
- Vidal-Meliá and Lejárraga-García (2006) for couples in Spain (See Section 4.2.1); and
- Purcal and Piggott (2008) for Japan (See Section 4.2.1).

Other studies that include empirical support for pre-existing annuities as part of the explanation for the annuity puzzle, which are further elaborated on in other sections include:

- Bernheim (1991) for the USA (See Section 4.2.1);
- Brown (2001) for the USA (See Section 4.4.1); and
- Inkmann et al. (2011) for couples in the UK (See Section 4.4.6).

4.2.4 Precautionary savings motive/liquidity constraints

Individuals with precautionary savings motives may choose not to fully annuitise. This is because annuitisation imposes liquidity constraints on retirement assets. If there is some probability that the individual will need liquidity to pay for uncertain future expenses, such as those for uninsured medical care, the retiree may wish to retain some wealth as a buffer against such future expenditure shocks. It has been suggested that many people avoid guaranteed annuities out of fear of the consequences of contracting a serious illness.

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[104] HRS survey data collected in 1994, 1996, 1998 and 2000.

[105] As is predicted by their life-cycle model with means-tested social benefits.

Brown (2001) provided empirical evidence that poor health status is a significant deterrent in people's intention to annuitise. Sinclair and Smetters (2004) showed, by applying a dynamic programming model, that uncertain health expenditure could explain the annuity puzzle in the USA, as health shocks may cause uninsured expenses and shorten the annuitant's life expectancy. Hence, when health shocks are severe, it may no longer be optimal for individuals to hold all their wealth in guaranteed annuities, even in the presence of actuarially fair guaranteed annuity markets and in the absence of bequest motives.

According to Ameriks et al. (2011), insufficient wealth for private long-term care and hence the need for public health care, may contribute to under-annuitisation and lack of wealth decumulation. To prove this notion, they introduced a "public care aversion" (PCA) parameter into a life-cycle model and estimated its importance, which they empirically showed to be a significant contributor based on a sample of 2005 AHEAD data. They concluded that the demand for guaranteed annuities would be far higher if guaranteed annuities included some form of long-term health care benefit[106] (Ameriks et al., 2011).

Peijnenburg, Nijman and Werker (2017) employed a utility maximising approach in order to determine the influence of health cost risk on the optimal annuity decision, based on 1996 to 2010 AHEAD data, as well as HRS data.[107] Their sample comprised of 4 144 households. They found that increased medical expense risk significantly reduced optimal annuitisation at retirement. Notwithstanding, they found that at age 75, annuitisation should represent about 90 percent of total wealth as mortality credits are very high at advanced ages.

Even though low annuitisation levels could be explained by a precautionary savings motive for health costs, it remains a puzzle why older individuals refrain from annuitising their capital.

4.2.5 Family risk-sharing strategies

A formal guaranteed annuity market functions because it can pool and spread mortality risk across many individuals. If individuals can pool mortality risk within smaller groups, such as families, then some of these gains from annuitisation are captured even in the absence of a formal guaranteed annuity market. According to the family strategy, based on an agreement, heirs are willing to bear the risk of the annuitant outliving his/her money, in return for a possible bequest (Schmeiser & Post, 2005).

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[106] In such a product which combines a guaranteed annuity with long-term care benefits, pricing could be improved as the two types of adverse selection can offset each other (Murtaugh, Spillman & Warshawsky, 2001: 237).

[107] The HRS data included exit interviews.

The arrangement is carried out by the retiree handing over his/her retirement monies to the heir, who promises to pay a guaranteed annuity-equivalent income stream to the retiree for the rest of his/her life. The benefit for heirs is the possibility of a bequest,[108] which comes at the risk of poor investment returns depleting the retiree's retirement monies,[109] and/or the retiree living unexpectedly long. Schmeiser and Post (2005) showed, using a simulation model, that the family strategy provides substantial potential with relatively low shortfall risk, using German market and annuity data. Private guaranteed annuity market arrangements could benefit from fairly accurate information about the retiree's health, thereby enabling the family to save on adverse selection and transaction costs. The family risk-sharing strategy (also known as intra-family risk-sharing, or intra-family transfers) need not be built on altruistic feelings, but simply reflects risk-sharing behaviour among family members. However, a certain level of mutual honesty and trust within the family is required for the family strategy to be effective (Kotlikoff & Spivak, 1981).

Post et al. (2006) confirmed and reinforced the idea that family risk-sharing and the high loads on annuities are jointly responsible for low levels of annuitisation in Germany. They showed that the following factors will increase the attractiveness of the family strategy in terms of a utility framework, namely: (i) low marginal tax rates among participants; (ii) wealthy heirs; and (iii) an annuitant with an average life expectancy. However, Hayashi, Altonji and Kotlikoff (1996) found no empirical evidence of general risk-sharing between and within families, based on a study conducted on two US Panel Study of Income Dynamics (PSID)[110] data sets, i.e. 1968 to 1981, and 1985 to 1987.

The infrequency of individuals buying guaranteed annuities may also be due in part to risk-sharing between husband and wife. In the case of marriage, individuals usually agree to pool their resources while both husband and wife are alive, and to further name each other as the major or sole beneficiary in their respective wills. For each partner the risk of living too long is partially hedged by the other partner's potential death. Therefore, if one partner becomes very old, there is a probability that the spouse will die earlier and leave him/her with a bequest[111] to finance his/her consumption (Kotlikoff & Spivak, 1981).

Brown and Poterba (2000) valued joint-guaranteed annuities in the USA, by specifying a utility function and computing the increase in wealth (or AEW) that would be needed to compensate couples who initially had access to actuarially fair annuity markets. Brown and Poterba (2000) found that the utility gain from annuitisation is larger for single individuals than for married couples, due to opportunities for mortality risk-sharing. This result was echoed by Kotlikoff and Spivak's simulation

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[108] Risk-sharing within families is thus closely related to the bequest motive.

[109] The heirs must therefore be in a position to guarantee a guaranteed annuity, which could be difficult in many cases.

[110] A survey based on a random sample of families in the USA.

[111] Risk-sharing between partners is thus closely related to the bequest motive.

findings (1981) as well as Brown's (2001) empirical findings, which demonstrates that life-cycle couples value guaranteed annuities less than individuals.

Brown and Poterba's (2000) findings further suggest that some couples with low risk aversion levels, or a significant portion of their wealth pre-annuitised, would not find the utility gains of annuitisation large enough to compensate for the loadings[112] present in guaranteed annuity markets. They also found that older annuitants value guaranteed annuities more than their younger counterparts. Brown and Poterba (2000) predicted the gains of annuitisation for married couples to be approximately half that of individuals. They finally noted that as married couples are usually the most likely guaranteed annuity buyers, this may help explain the limited demand for this market.

Other empirical studies conducted that found support for risk-sharing between husband and wife, which are further elaborated on in other sections are:

- Brown (2001) for the USA (See Section 4.4.1);
- Hurd and Panis (2006) for the USA (See Section 4.4.4);
- Bütler and Teppa (2007) for Switzerland (See Section 4.4.5); and
- Inkmann et al. (2011) for the UK (See Section 4.4.6).

However, Cappelletti et al. (2013) found no empirical evidence of risk-sharing between husband and wife in Italy (See Section 4.4.3).

4.2.6 Default risk of insurance companies

Babbel and Merrill (2007) were the first scholars to include the possibility of default by the insurer issuing guaranteed annuities in terms of a life-cycle framework, to model individual behaviour in the USA. They found that even a little default risk can significantly hinder guaranteed annuity purchases. Babbel and Merrill (2007) concluded that state insolvency guarantee programmes can have a positive impact on rational guaranteed annuity purchases. However, Lopes and Michaelides (2007), by following the standard life-cycle model, disagreed that the probability of such a rare event can explain the annuity puzzle in the USA. They argued that high risk aversion is needed for behaviour to be affected by such rarity, but that high risk aversion also increases the value of annuitisation.

Schulze and Post (2010) showed that aggregate mortality risk (i.e. the unexpected change in mortality for a specific population or uncertainty regarding future patterns in mortality) is a key determinant in individual annuitisation decisions and it may either alleviate or intensify the annuity puzzle.[113]

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[112] The EPDV of the average annuity in the marketplace in 1995 was between 80 and 85 percent of its initial premium (Mitchell et al., 1999: 1316).

[113] They conducted their study in terms of a utility maximising framework based on German data.

Expected changes in mortality may result from medical innovations, or the increased occurrence of very hot summers as a consequence of climate change, and may affect the insurance company's risk of defaulting on income payments.

4.2.7 Interest rates

Williams (1986) conducted an experiment by asking 20 industrial relations students in the USA to choose between a lump sum versus a guaranteed annuity under various interest rate and longevity assumptions. He found that high interest rates[114] and long life expectancies decrease the demand for guaranteed annuities. Williams (1986) based his findings on two grounds, i.e. that (i) longer life expectancies increase the price of annuitisation, and hence decrease demand; and (ii) higher interest rates did not sufficiently translate into higher annuity income, compared to interest earned on the lump sum.[115]

In conclusion, according to his model, if interest rates are low and life expectancies are short, a guaranteed annuity provides a much higher annual income than interest on the lump sum. Conversely, if interest rates are high and life expectancies are long, a guaranteed annuity does not provide much more annual income than interest on the lump sum.[116]

4.2.8 Flexibility and control

The guaranteed annuity option is irreversible/irrevocable. Following the annuitisation route allows the annuitant no control over his/her savings in terms of asset allocation, income drawdown rates, and investment managers, among others. Rusconi (2006) found evidence of individuals fully retiring much later in life. The transition from full-time work to no work at all therefore often happens gradually, in which case income flexibility is important.

4.2.9 Lack of consumer awareness and education

Rusconi (2006) intended primarily to provide some insight into the dynamics of the individual retirement income decision-making process. He achieved this by assessing studies reporting on several surveys[117] of consumers' understanding and attitude towards retirement in general and towards annuity products more specifically. One of the main results emerging from these surveys

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[114] This occurred even if the potential annuitant did not believe that he/she could earn higher interest rates than the life insurer used to calculate the lifetime annuity income.

[115] The present value of the guaranteed annuities.

[116] The effect of longer life expectancies on guaranteed annuity demand was weaker than that of higher interest rates.

[117] Studies reported on the following surveys: (i) Two Merrill Lynch studies (Merrill Lynch, 2005; 2006); (ii) Watson Wyatt report (Gardner & Wadsworth, 2004); (iii) Association of British Insurers (ABI) studies (ABI, 2005a; 2005b); (iv) The Teachers Insurance and Annuity Association and College Retirement Equities Fund (TIAA-CREF) study conducted in the USA (Ameriks, 2002).

was that consumers demonstrate varying levels of understanding of the benefits and disadvantages of annuitisation.

Ganegoda and Bateman (2008) suggested that the thin and fading market for guaranteed annuities in Australia might be the result of a lack of consumer awareness of the risks of not annuitising, as well as underestimating longevity risk.[118]

Bateman, Eckert, Geweke, Iskhakov, Louviere, Satchell and Thorp (2013) conducted a choice experiment among 854 respondents nearing retirement in Australia. They analysed the impact of disengagement and poor understanding on the quality of the respondents' intentions to allocate retirement benefits. Respondents who reduced their exposure to longevity risk with annuitisation, turned out to be more engaged respondents who knew how AIPs worked. They also found that people with higher financial capability are more engaged with the retirement allocation decision-making process, and are thus in a better position to manage longevity risk.

4.2.10 The behavioural angle

As rational explanations based on expected utility theory seem unable to provide satisfactory justification for the annuity puzzle, behavioural theory has been considered to inform standard economic theory. According to Richter, Schiller and Schlesinger (2014: 86), behavioural theory attempts to identify cognitive factors[119] that influence decision-making, culminating in the development of various behavioural biases. Various authors have found evidence of behavioural biases present in people's decision-making, specifically with respect to retirement income options.

Hu and Scott (2007) performed quantitative analyses by applying the standard expected utility model in light of prospect theory, based on certain assumptions within the US context. They claimed that mental accounting,[120] where annuity decisions are isolated from their impact on total retirement spending, as well as loss aversion, originating from prospect theory, can cause a retiree to view guaranteed annuities as a risky gamble where potential losses loom larger than potential gains.[121] They suggested that financial advisors should frame guaranteed annuities as longevity insurance, which reduces the need for precautionary savings and allows retirees to consume more during retirement by reducing their risk of having to decrease spending if they should live well beyond their life expectancy.

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[118] They conducted their study under a utility-based framework. They found the MWR of guaranteed annuities to be on a downward path and significantly lower compared to other countries based on 2006 data.

[119] For example, an individual's social context, emotions, hopes, fears, and observations of other decision-makers' behaviour.

[120] Referring to the tendency to separate financial assets into separate accounts based on subjective criteria such as the source of the money and the intended use for each account.

[121] Loss aversion is exacerbated in circumstances where retirees are more uncertain about their own survival probabilities.

Brown, Kling, Mullainathan and Wrobel (2008) explored the idea that the lack of guaranteed annuity demand is not a fully rational phenomenon, but may rather be due to behavioural biases. The framing effect refers to individuals basing their decision-making on the framing of choices or alternatives. The model by Brown et al. (2008) proposed two frames: (i) an investment frame, in which the individual decides how to invest retirement assets; and (ii) a consumption frame, in which the individual decides how to spend money in retirement.

Brown et al. (2008) found that instead of viewing the decision to annuitise through the consumption frame (focusing on what can be spent over time), many retirees adopt an investment frame (focusing on the return and risk features when choosing retirement assets, without considering the consequences for consumption).[122]

Individuals therefore essentially isolate one choice (how to invest) from others (how to consume) and focus on specific features of that choice, rather than viewing it as part of a whole. The unattractive feature of annuitisation in the investment frame will be the potential to lose money in the event of death. However, under the consumption frame, annuitisation is attractive, as it serves as a form of insurance for consumption throughout retirement. Similarly, the attractive feature of self-annuitising under the investment frame is the possibility of generating superior investment returns, whereas the unattractive feature of self-annuitisation under the consumption frame is the possibility of outliving retirement capital. This behavioural bias is in line with Tversky's and Kahneman's (1981) prospect theory, according to which individuals dislike losses more than equivalent gains relative to a reference point, e.g. their current wealth position.[123] Individuals are thus more willing to take risks to avoid a loss, than they are willing to take risks for an equivalent gain.

Hence, in the model proposed by Brown et al. (2008), individuals will dislike the possibility of a loss more, and will rather take the risk of outliving retirement capital, than living with the fear of losing capital when annuitising.

Brown et al. (2008) collected data to test their hypothesis in an internet survey conducted in December 2007. A total of 1 342 individuals completed the survey, by answering seven questions, each consisting of a hypothetical scenario. Survey evidence was consistent with their hypothesis that framing matters: The vast majority of individuals preferred a guaranteed annuity over alternative products when presented in a consumption frame, whereas the majority of individuals preferred non-annuitised products when presented in an investment frame. To the extent that the investment frame is the dominant frame for consumers making financial planning decisions for retirement, this finding may help to explain why so few individuals annuitise.

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[122] This bias is closely related to choice bracketing and mental accounting (Read, Loewenstein & Rabin, 1999; Thaler, 1985).

[123] A.k.a. risk orientation.

Gazzale and Walker (2009) explained the annuity puzzle by conducting an experiment. They found evidence of two behavioural biases, i.e. (i) the endowment effect (which stems from loss aversion), and (ii) risk-ordering bias.[124] According to the endowment effect, a retiree may be reluctant to exchange a (big) lump sum at retirement for a (small) uncertain income stream of payments. In their experiment Gazzale and Walker (2009) found that subjects were less likely to select the guaranteed annuity option relative to the lump sum when retirement assets were presented as a lump sum. Conversely, subjects were more likely to select the guaranteed annuity option relative to the lump sum when retirement assets were presented as an income stream of payments in the experiment. Risk-ordering bias relates to retirees placing too much weight on the probability of dying early (i.e. overweighting the probability of near periods), relative to the probability of a long retirement, and therefore lump sums are preferred to an income stream of payments, as the risk of an early death naturally precedes the risk of outliving one's assets. It therefore seems easier for individuals to imagine dying early, than outliving their life expectancy.

According to Benartzi et al. (2011: 155), framing effects could be even more prominent when the decision-maker has not fully deliberated the decision problem, and where knowledge from previous experience cannot be applied, given that retirement occurs only once.

Beshears, Choi, Laibson, Madrian and Zeldes (2014) conducted two surveys in which they elicited hypothetical annuity choices. They examined *inter alia* what factors individuals deem important in making choices about annuitisation. Their study suggested that three factors in particular play an important role in an individual's choice about annuitisation: (i) adequacy of income later in life; (ii) flexibility in the timing of spending; and (iii) their perception about the insurance company's ability to pay guaranteed annuities in the future.[125]

Framing annuitisation as the lack of flexibility and control over the investment of retirement assets had a significant effect on guaranteed annuity demand. Beshears et al. (2014) also found that allowing individuals to annuitise a portion of their wealth increased annuitisation relative to a situation where annuitisation is an all-or-nothing decision. Beshears et al. (2014) warned that hypothetical choices are to be interpreted with caution, since they may not closely correspond to the choices people would actually make.

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[124] This bias was first investigated by Gazzale and Walker (2009). Risk-ordering bias stems from the availability heuristic, according to which events that are more easily imagined, carry a greater likelihood of occurring, as opposed to events that are more difficult to imagine (Tversky & Kahneman, 1974: 1 127).

[125] All three these factors significantly correlated with the fraction of retirement assets annuitised. Annuitisation had a positive correlation with the importance placed on having enough income later in life, while it had a negative correlation with the importance placed on flexibility in the timing of spending, and worries about counterparty risk.

A factor that affects the decision to annuitise, is how long one is likely to live, as people who have a longer-than-average life expectancy benefit more from annuitisation. Therefore, pondering annuitisation provokes thoughts not only of when one's own death may occur, but at the same time the potential loss of one's retirement capital at death. Salisbury and Nenkov (2016) offered mortality salience[126] as an explanation for the annuity puzzle based on four experiments conducted in the USA (which is further elaborated on in Section 3.4.5), and argued that retirees avoid choosing the guaranteed annuity as a defence against facing their own mortality.

Brown, Luttmer, Kapteyn and Mitchell (2017) performed an experiment using 2011 Research and Development (RAND) American Life Panel[127] data to show that a person's cognitive ability influences his/her ability to subjectively value an income stream of guaranteed annuity payments. They attempted not to explain the annuity puzzle but to rather test whether individuals' internal valuations are consistent. For the data collected in June and August 2011, a total number of 2 112 respondents completed the survey. They presented individuals with the opportunity to exchange a portion of their lump sum for a guaranteed annuity, referred to as buying, and alternatively to decrease a portion of their annuitised holdings in exchange for a lump sum, referred to as selling. The buying question asked how much a person would be willing to pay to increase his/her guaranteed annuity benefit, whereas the selling question asked how much a person would have to be compensated for to give up part of his/her guaranteed annuity benefit.

Brown et al. (2017) found that people on average value guaranteed annuities less when they are given the opportunity to buy or increase their guaranteed annuity holdings. In contrast, they value guaranteed annuities more when given the opportunity to sell or decrease their guaranteed annuity holdings. The buy-sell spread was negatively correlated with cognitive ability as measured by education, financial literacy and numeracy. Therefore, the authors ascribed the buy-sell spread to the difficulty individuals experience in valuing a stream of guaranteed annuity income payments. Brown et al. (2017) found no definitive evidence of the *status quo* or endowment effect to explain their results. Also, the vast majority of respondents specifically indicated that their responses were not due to liquidity constraints.

Anchoring effects (i.e. sensitivity to starting values) were present, especially for the respondents with lower cognitive ability. Also, the buy-sell spread differed when values were shown from "large to small" or "small to large" across all respondents at all cognitive levels.

In summary, it seems that individuals are prone to several behavioural biases when they make decisions. Also, cognitive limitations could affect retirees' decisions with respect to their choice of a retirement income option. The ability to identify and understand these forces that influence our

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[126] Defined as the increased accessibility of thoughts related to one's own death (Salisbury & Nenkov, 2016: 137).

[127] A panel of US households that regularly take Internet surveys.

decision-making, could bring a certain awareness to the surface, in order to enable retirees to make a well-deliberated choice that is in their best interest. It should be kept in mind that behavioural factors could also deepen the annuity puzzle as guaranteed annuities offer a solution to very complex problems, i.e. when to retire and how much to spend in retirement.[128]

A summary of the resolutions are given in Table 4.1, and categorised in two columns of literature either in support of, or in opposition to the resolution.

Table 4.1: Factors to explain the annuity puzzle[129]

Factor	Verification	In opposition
Bequest motive	Friedman & Warshawsky (1988; 1990); Bernheim (1991); Laitner & Juster (1996); Gardner & Wadsworth (2004); Vidal-Meliá & Lejárraga-García (2006); Kopczuk & Lupton (2007); Purcal & Piggott (2008); Pashchenko (2010); Ameriks et al. (2011); Lockwood (2012) ***For couples:*** Inkmann et al. (2011)	Hurd (1987; 1989); Wilhelm (1996); Brown (2001); Cappelletti et al. (2013)
Actuarially unfair annuity pricing	Friedman & Warshawsky (1988; 1990); Finkelstein & Poterba (2002; 2004); Post et al. (2006); Vidal-Meliá & Lejárraga-García (2006); Purcal & Piggott (2008); Shu et al. (2016)	Mitchell et al. (1999)
Pre-annuitised wealth	Bernheim (1991); Brown & Poterba (2000); Brown (2001); Dushi & Webb (2004); Vidal-Meliá & Lejárraga-García (2006); Purcal & Piggott (2008); Pashchenko (2010); Inkmann et al. (2011); Bütler et al. (2014)	
Precautionary savings motive	Brown (2001); Sinclair & Smetters (2004); Ameriks et al. (2011); Peijnenburg et al. (2017)	
Risk-sharing within families	Schmeiser & Post (2005); Post et al. (2006) ***For couples:*** Kotlikoff & Spivak (1981); Brown & Poterba (2000); Brown (2001); Hurd & Panis (2006); Bütler & Teppa (2007); Inkmann et al. (2011)	Hayashi et al. (1996) ***For couples:*** Cappelletti et al. (2013)
Default risk of insurance companies	Babbel & Merrill (2007) Schulze & Post (2010)	Lopes & Michaelides (2007)
Interest rates	Williams (1986)	
Flexibility and control	Rusconi (2006)	
Lack of consumer awareness and education	Rusconi (2006); Ganegoda & Bateman (2008); Bateman et al. (2013)	
Behavioural angle	Hu & Scott (2007); Brown et al. (2008); Gazzale & Walker (2009); Beshears et al. (2014); Salisbury & Nenkov (2016); Brown et al. (2017)	

Source: Author's conception.

[128] This point was also highlighted by Benartzi et al. (2011: 143).

[129] Resources include empirical studies discussed mainly in Section 4.4.

4.3 SOUTH AFRICAN EVIDENCE

According to National Treasury (2012), and informally reported on by Rusconi (2006), the following factors seem to explain the low demand for guaranteed annuities in South Africa, despite the fact that they are reasonably priced.

i) **Social Old Age Grant (SOAG).** Pre-existing annuitisation in the form of social security payments may explain the low demand for annuitisation in South Africa, only to the extent that it applies to the relatively poor. The amount of the so-called means-tested SOAG in South Africa is announced in the national budget speech every year, which amounts to R1 860 per month for unmarried individuals who are at least 60 years of age. Unmarried individuals older than 75 years receive R1 880 per month. To qualify for the grant, an unmarried individual's income may not exceed R78 120 per year (R6 510 per month) and his/her assets may not be worth more than R1 115 400. In the case of married individuals, joint income may not exceed R156 240 per year (R13 020 per month) and joint assets may not be worth more than R2 230 800 (South African Government, 2020). The means test could potentially discourage workers from saving for retirement, as the grant will guarantee a floor level of income. In addition, it may encourage low-income workers to choose living annuities and withdraw their assets, as they may then become eligible for the SOAG at a later date.

ii) **Loss of retirement capital in the event of early death.** Guaranteed annuities represent poor value, especially to lower income employees who expect to die soon after retiring from employment as a result of ill health.

iii) **Private mortality pooling**. Individuals can pool mortality risk privately, with their spouse and families, and other informal support networks.

iv) **Investment in others**. Retirement money from one family member could be used to invest in the education or health of younger members. Once they are earning, they would in return support the retiree.

v) **Liquidity**. In general, most people prefer liquid assets and are unwilling to lock up their money with an insurance company for a long time. This is particularly relevant here, because many retirees in South Africa pay for private health care rather than rely on the state.

vi) **Higher returns/investor confidence**. Many individuals prefer to take on investment risk when they retire in exchange for higher expected returns. Two factors influence their choice. Firstly, many retirees aged 65 can expect to live for another 20 years. Over these time horizons, some higher-risk investment may be appropriate. Secondly, conventional guaranteed annuities force individuals to invest implicitly in the assets that insurers use to back their promise – usually in low-yield, long-term bonds. High share market returns also give South Africans confidence in their belief to earn superior investment returns.[130]

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[130] Goedde-Menke, Lehmensiek-Starke and Nolte (2014) suggested that retirees who feel more competent than banks or insurers in managing retirement capital are less likely to purchase guaranteed annuities.

vii) **Low levels of income**. Guaranteed annuity rates are a function of interest rates in the economy. Therefore, if interest rates are high, annuity rates offered on newly-issued annuities will be correspondingly high. Individuals may elect not to purchase a conventional annuity if interest rates are at a low point, preferring to wait until rates rise.[131] Long-term interest rates in South Africa are at relatively low levels in 2019/2020, compared to rates in 2008, for example.

viii) **Falling levels of trust in insurance companies**. This is confirmed by anecdotal evidence in Rusconi (2006). This occurrence could possibly be explained by people's perception that the life insurance industry, in its pursuit of profitability, exploits annuity holders.[132] On the other hand, as very few people actually purchase guaranteed annuities, it could be argued that returns received from other insurance-based investment products (or policies) and the fees charged for managing investment funds could possibly lead to the lack of trust in the insurance industry.

4.4 ANNUITY CHOICE: INTENT AND DECISION-MAKING AT RETIREMENT

Although there is a well-developed body of literature investigating the theoretical explanations for individuals' annuitisation decisions, there are few international studies that test these relationships empirically. It is difficult to assess annuity demand and its determinants empirically as in most countries individual demand is almost non-existent. There are six main studies on the many factors influencing annuitisation decisions, three of which are based on intentions reported by respondents (Brown, 2001; Gardner & Wadsworth, 2004; Cappelletti et al., 2013) and three of which are based on actual decisions taken (Hurd & Panis, 2006; Bütler & Teppa, 2007; Inkmann et al., 2011).

These studies are discussed below, followed by a summary of each study's principal findings, as they relate to individuals' intention to annuitise (Table 4.2) and the actual annuity decision (Table 4.3).

4.4.1 Brown (2001)

Brown (2001) tested whether individuals who are predicted by the simple Yaari model to have a higher inclination to annuitise, were in fact more likely to annuitise. He estimated the AEW for a sample of 869 actual US households with a significant amount of wealth in DC plans, in the first wave of HRS data assembled in 1992 for individuals aged between 51 and 61 (with spouses of any age). Brown's testing of the standard life-cycle model[133] studied only the participants' intention to

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[131] This contradicts evidence by Williams (1986), who found that high interest rates decrease guaranteed annuity demand. This could possibly be attributed to the fact that higher interest rates assumed in his model did not significantly translate into higher guaranteed annuity payments.

[132] Goedde-Menke et al. (2014) also noted that retirees' reluctance to annuitise could be attributed to their lack of trust in banks and insurers.

[133] Indicating that without bequest motives, everyone will have a positive gain from annuitisation, in the presence of actuarially fair annuity markets. The extent of the gain, however, depends on various assumed economic parameters.

annuitise, as the average age of the participants of 55 years did not allow him to take their final decisions into account. He considered answers to the question: “In what form do you expect to receive benefits?” The binary dependent variable is the intention to annuitise. Brown (2001) found that the basic tenets of the theory provided by many variations on the simple life-cycle model were confirmed, as single individuals with higher risk aversion, higher retirement age,[134] higher year of birth (i.e. younger individuals with longer life expectancies), as well as a smaller fraction of pre-annuitised retirement wealth, tend to prefer annuitisation.

Brown (2001) reported that three additional factors that were not captured by the simple Yaari model seem to significantly affect guaranteed annuity demand. Firstly, individuals with self-reported short time horizons for financial decision-making, rarely choose to annuitise. Secondly, individuals with poor health status are 30 percent less likely to annuitise. Thirdly, wealthy individuals with substantial bequeathable assets mostly do not intend to annuitise their wealth as he argued, such individuals do not fear running down their resources. His results also confirm that bequest motives are not a significant determinant of marginal annuitisation behaviour.

In conclusion, Brown’s findings show that guaranteed annuity decisions are significantly correlated with the predictions of extensive simulation work in previous studies under the life-cycle framework in terms of mortality risk,[135] marital status, risk aversion,[136] and the presence of pre-existing annuities, and are therefore useful first predictors of household behaviour.

4.4.2 Gardner and Wadsworth (2004)

Gardner and Wadsworth (2004) conducted a survey of 3 511 UK individuals within a few years of retirement (aged 50 to 64 years), to assess their attitudes to guaranteed annuities. More than half of the respondents indicated that they would prefer never to annuitise.

The reasons that were chosen by respondents from a list of possibilities to explain their unwillingness to annuitise included:

i) Their desire for flexibility;
ii) The belief that they could earn a higher income (compared to the income stream provided by a guaranteed annuity) by investing retirement capital themselves;
iii) The bequest motive; and
iv) The belief that they would not live long enough to make the guaranteed annuity a suitable option.

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[134] Insurers are willing to pay higher guaranteed annuity payments to older retirees.

[135] The value of guaranteed annuities is affected by the degree of mortality risk the individual faces. In this way, people who know their date of death with absolute certainty will not place a positive value on annuitisation (Brown, 2001: 44).

[136] People with high risk aversion value the longevity insurance aspects of guaranteed annuities more highly (Brown, 2001: 44).

A reason put forward by respondents voluntarily is their lack of trust in life insurance companies. Those with poorer education, incomes or health were more likely to be opposed to annuitisation. Smaller households with most of their wealth in DC retirement funds were more likely to favour annuitisation. In addition, respondents with higher levels of patience seemed to favour annuitisation (Gardner & Wadsworth, 2004).

4.4.3 Cappelletti et al. (2013)

In Italy, Cappelletti et al. (2013) found a strong demand for the guaranteed annuity option, as opposed to the cashing-out option, by employing data from a sample of the Survey of Household Income and Wealth (SHIW)[137] for 4 750 heads of households aged 65 years and younger for the 2008 wave. After performing a multi-variate analysis, their results seem to contrast with the apparent thinness of the guaranteed annuity market in Italy.

The answer to the following hypothetical question represented their dependent variable: “Imagine you are 65 years old and receive a total pension income of €1 000 a month (adjusted for inflation). Would you be willing to give up half that pension for the whole of your old age in exchange for a lump sum of €60 000 to be paid immediately?” Subsequently, those respondents who preferred the annuity to the lump sum, were asked what their preference would be if the lump sum increased to €80 000 and €100 000 respectively.[138]

A total of 69 percent of the respondents preferred the annuity against the lump sum of €80 000. This percentage of respondents who preferred the guaranteed annuity decreased to 40 percent for a lump sum of €100 000, and increased to 82 percent for a lump sum of €60 000. The money’s worth ratio[139] (MWR) is estimated to be 77 percent in Italy, which is lower than what is typically found in similar developed markets (Guazzarotti & Tommasino, 2008).

The results of the study by Cappelletti et al. (2013) highlight the importance of wealth, schooling and financial literacy in shaping guaranteed annuity demand. They specifically showed that guaranteed annuity demand is significantly lower for poorer, less educated individuals, with inferior financial literacy with respect to especially two proxies, namely knowledge of inflation and pension benefits.

They also found that those who are impatient and in poor health annuitise less. Furthermore, share market participation reduced the propensity to annuitise. Some of their results are at odds with rationality. For example, they did not find evidence that the longer life expectancies of women and

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[137] The SHIW is a large representative survey of the Italian population conducted by the Bank of Italy.

[138] €80 000 corresponds with the price that would leave a risk-neutral 65-year-old married male indifferent, in net present value terms, between buying and not buying the guaranteed annuity, considering the official mortality rates and an annual three percent real interest rate.

[139] The present value of the expected lifetime income stream, divided by the initial premium. Guaranteed annuity income payments are weighted by the probability that the annuitant will be alive to receive it. An MWR of less than one indicates that individuals will on average receive less in guaranteed annuity payments than they paid in premiums.

younger cohorts tend to prefer annuitisation. In addition, risk aversion, marital status and the presence of children did not seem to influence annuity preference.

4.4.4 Hurd and Panis (2006)

Hurd and Panis (2006) analysed pension cash-outs in the USA using a sample of 6 099 respondents from HRS data for the 1992 to 2000 waves by performing a multi-variate analysis. Their results are similar to those of Brown (2001). However, they did not distinguish between cash-out choices at the time of retirement and those made when the worker changed employment, but stayed in the labour force, which was the case for 40 percent of their sample. Hurd and Panis (2006) found that those with a lower accumulation of retirement assets chose to cash out more. Their results differ from Brown (2001) in the following ways: higher cash-out rates were documented for females, as well as for younger, poorer and less educated individuals.

4.4.5 Bütler and Teppa (2007)

Bütler and Teppa (2007) based their analysis on micro administrative records[140] from ten (10) Swiss occupational pension sponsors, by directly examining 4 544 individuals' decisions to annuitise or to cash out pension wealth with retirement years between 1996 and 2006.

Bütler and Teppa (2007) applied the same methodology as Brown (2001), but used actual choices instead of intentions. Their results are mostly in line with those of Brown (2001) as well as Hurd and Panis (2006). Bütler and Teppa (2007) also showed that low accumulation of retirement assets is strongly associated with the choice of a lump sum, mainly because of the availability of means-tested social assistance.

4.4.6 Inkmann et al. (2011)

Inkmann et al. (2011) provided an in-depth empirical analysis of the characteristics of households that voluntarily annuitise in the UK, by performing a multi-variate analysis, based on the first and second wave of data collected in 2002 and 2003, from the English Longitudinal Study of Ageing (ELSA).[141]

The 5 233 respondents were aged 50 years and above, with partners of any age, but with at least one of them retired. Inkmann et al. (2011) found that guaranteed annuity demand increased with financial wealth, life expectancy, risk aversion and education, and decreased with the existence of other pension income and a possible bequest motive for surviving spouses.

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[140] Administrative data has the benefit of being reliable, but the disadvantage of not providing a lot of detail about the individual.

[141] A bi-annual longitudinal survey among those aged 50 and over, and their spouses, living in England in 2002 (Inkmann et al., 2011: 285).

Their findings are similar to those of Brown (2001) with respect to some factors affecting guaranteed annuity participation, even though their method differed slightly. As in the case of Brown (2001), Inkmann et al. (2011) found no evidence of a bequest motive when using the variable of children as a proxy for such motive. They also found that married individuals were less likely to annuitise.

Their results differ in other ways: for example, education and subjective survival probabilities are significant in their analysis while they are non-significant in that of Brown (2001). In addition, self-reported health states were non-significant in their analysis, whilst being significant in that of Brown (2001). Most importantly, Inkmann et al. (2011) found that wealth had a strong positive impact on the probability to annuitise, while it was negative and of small significance in Brown's (2001) analysis. Moreover, Brown (2001) did not consider portfolio choice variables, while Inkmann et al. (2011) considered the impact of share and life insurance market participation on the probability of annuitisation, which are both positively correlated with the propensity to annuitise.

Table 4.2 shows the principal findings of the studies discussed above, relating to individuals' intention to annuitise. Table 4.3 shows the principal findings relating to individuals' actual annuity decision.

Table 4.2: International empirical evidence on the intention to annuitise

Source / Main findings	Brown (2001) USA	Gardner & Wadsworth (2004) UK	Cappelletti et al. (2013) Italy
Marital status	Single individuals are more likely to annuitise	Not investigated	Non-significant
Gender	Non-significant	Not investigated	Non-significant
Risk aversion	Higher risk aversion leads to higher intentions to annuitise	Not investigated	Non-significant
Retirement age	Individuals who intend to retire at older ages have a higher propensity to annuitise	Not material	Not investigated
Year of birth	Younger individuals have a higher intention to annuitise	Not investigated	Non-significant
Pre-annuitised wealth	Presence of pension-like income reduces intention to annuitise	Not investigated	Not investigated
Impatience	Less patient individuals intend not to annuitise	Less patient individuals intend not to annuitise	Less patient individuals intend not to annuitise
Health	Individuals in poor health intend to annuitise less	Individuals in poor health intend to annuitise less	Individuals in poor health intend to annuitise less
Income and wealth	Wealthier individuals intend to annuitise less	Poorer individuals intend to annuitise less	Poorer individuals intend to annuitise less
Bequest motive	Non-significant	Bequest motive reduces intention to annuitise	Non-significant
Accumulation of retirement assets	Not investigated	Not investigated (Individuals with a majority of their wealth in DC funds, intend to annuitise more)	Not investigated
Education	Non-significant	Individuals with a higher level of education, intend to annuitise more	Individuals with a higher level of education, intend to annuitise more
Subjective survival probability	Non-significant	Not investigated	Not investigated
Share market and life insurance participation	Not investigated	Not investigated	Share market participation positively correlated with self-annuitisation
Household size	Not investigated	Smaller households intend to annuitise more	Not investigated
Financial literacy	Not investigated	Not investigated	Lower financial literacy leads to lower intention to annuitise

Source: Author's conception.

Table 4.3: International empirical evidence on the annuity choice

Source/ Main findings	Hurd & Panis (2006) USA	Bütler & Teppa (2007) Switzerland	Inkmann et al. (2011) UK
Marital status	Those who are divorced, widowed or separated cash-out more	Married males annuitise less, but married females annuitise more	Married individuals annuitise less
Gender	Higher cash-out rates for women	Higher cash-out rates for women	Not investigated
Risk aversion	Not investigated	Higher risk aversion leads to higher levels of annuitisation	Higher risk aversion leads to higher levels of annuitisation
Retirement age	Not investigated	Guaranteed annuity demand increases with age in retirement	Guaranteed annuity demand increases with age in retirement
Year of birth	Younger individuals cash-out more	Not investigated	Not investigated
Pre-annuitised wealth	Individuals who think social security might become less generous, had a lower cash-out rate	Not investigated	Presence of pension-like income (e.g. social security) reduces annuitisation
Impatience	Individuals with a longer planning time horizon had a lower cash-out rate	Not investigated	Not investigated
Health	Individuals in poor health cash-out more	Not investigated	Non-significant
Income and wealth	Poorer individuals cash-out more	Poorer individuals cash-out more (implied)	Poorer individuals annuitise less
Bequest motive	Not investigated	Inconclusive	Bequest motive to spouse reduces annuitisation
Accumulation of retirement assets	Low accumulation is strongly associated with cashing-out	Low accumulation is strongly associated with cashing-out.	Not investigated
Education	Non-significant, but less-educated more often chose to cash-out	Not investigated	Individuals with a higher level of education annuitise more
Subjective survival probability	Non-significant	Not investigated	Individuals with higher self-reported survival to specific advanced ages, annuitise more
Share market and life insurance participation	Not investigated	Not investigated	Individuals who participate in share and life insurance markets, annuitise more
Household size	Not investigated	Not investigated	Not investigated
Financial literacy	Not investigated	Not investigated	Not investigated

Source: Author's conception.

4.5 TWO CASE STUDIES OF COUNTRIES WITH HIGH RATES OF ANNUITISATION

4.5.1 The Chilean case

In contrast to the low levels of voluntary annuitisation that have been documented in many countries like the USA (Brown, 2001), UK (Finkelstein & Poterba, 1999), Canada (Kim & Sharp, 1999) and Australia (Borowski, 2008), guaranteed annuities are the greatest contributor to the large Chilean life insurance industry. James, Martinez and Iglesias (2006) documented that almost two-thirds of Chilean retirees annuitise, even though government has not mandated it. In Chile, retirees have a choice between early versus normal retirement[142] and annuitisation versus strictly-controlled programmed withdrawals, where lump sum cash-outs are to a large degree not allowed. James et al. (2006) posed the following as reasons for the high annuitisation rate in Chile:

i) Regulations limiting pay-out choices;[143]
ii) The elimination of DB funds (except for the partially means-tested minimum pension guarantees (MPG) financed by government);
iii) A government guarantee on guaranteed annuities;
iv) Competition among insurance companies offering a high money's worth ratio (MWR);[144] and
v) Aggressive marketing of guaranteed annuities.

Most Chilean employees with small accumulations retire at the normal age, and choose programmed withdrawals, in order to qualify and meet the eligibility criteria for the public MPG. On the other hand, Chilean employees with large accumulations who meet the minimum accumulation requirement, retire early[145] and are assisted by insurance company salesmen/brokers to purchase guaranteed annuities – the only source of meaningful investment and longevity insurance available to them.

Regulatory incentives therefore make it easier to retire early if the annuitisation route is followed, as insurance company brokers keep track of employees' accumulations, inform them of their eligibility for early retirement, and offer them administrative assistance. Generous commissions are paid to these salesmen/brokers, who actively pursue workers with large accumulations as potential clients, at the earliest point of eligibility.[146] In contrast, pension funds that administer and pay out programmed withdrawals, are not permitted to pay commissions to brokers, and therefore have no incentive to convince their members to become pensioner clients. Retirees with the largest

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[142] The decisions to retire from employment and from the retirement fund do not have to occur simultaneously.

[143] Retirees choose between price-indexed guaranteed annuities sold by insurance companies vs. programmed withdrawals administered and paid out by pension funds. Lump sum withdrawals are mostly not permitted.

[144] MWR in Chile is close to 100 percent for inflation-escalating or price-indexed guaranteed annuities.

[145] In taking early retirement, the individual stops contributing, and either consumes or saves in a more flexible form.

[146] Early retirement is permitted once workers can finance a pension that is 110% of the MPG and 50% of their own average salary.

accumulations seem to choose phased withdrawals, since they can self-insure and enjoy the other benefits, such as leaving a bequest.

Even though evidence of adverse selection based on asymmetric information about short-run health status among annuitants was found, it does not seem to deter the high rate of annuitisation. In fact, the high MWR of guaranteed annuities could be attributed to the availability of numerous price-indexed financial instruments available to insurance companies with the view to match their liabilities to guaranteed annuity holders, as well as the requirement of price-indexed guaranteed annuities, where the possible adverse selection effects of nominal versus real guaranteed annuities are eliminated.

4.5.2 The Swiss case

High annuitisation has been documented for the Swiss. Switzerland's pension system has two main pillars: (i) a publicly-financed scheme; and (ii) a mandatory occupational pension scheme, where lump sum withdrawals are permitted.[147] Where the combined pension income from the two pillars is not sufficient to cover the basic needs in old age, earnings-related supplemental benefits can be claimed.

Avanzi (2010) claimed that the high level of annuitisation in Switzerland can be attributed to the following factors:

i) When retirees annuitise, they leave their savings with the pension fund of which they had been a member for decades in many cases. Pension funds have time to create and foster trust with their future pensioners. In addition, the Security Fund, a reinsurer, guarantees a considerable part of the guaranteed annuity.
ii) Annuitisation is the default option, so it is simple and easy, and requires no underwriting.
iii) Pension funds are highly regulated, and the Swiss are usually very confident in their regulation processes.
iv) Both pension fund savings and guaranteed annuities in force are guaranteed by the pension fund, irrespective of the performance of the financial markets. In this way, retirement savings, once acquired, cannot be reduced. Thus market risk is not transferred to the individuals, but is borne by the pension fund. The advantage of this system is that market risk can be pooled between generations and smoothed out over decades. In the unlikely event that the pension fund should become insolvent, a certain minimum level of savings is guaranteed by a reinsurer, the Security Fund.

[147] A third pillar relates to individually-owned voluntary investments that enjoy favourable tax treatment, but are subject to constraints and regulation.

vi) A minority of the Swiss own their home. If they do, it is not optimal to own it completely and people will typically hold a mortgage for life, if they want to minimise their taxes.[148] This means that, whether they own their home or not, there will be a series of negative cash flows to match during their retirement time (either the rent or the interest on the mortgage). The option of annuitisation may thus represent a sensible strategy to match these cash flows.

vii) Pension funds in Switzerland offer, apart from annuitisation, a capital amount at death as a standard benefit for retirees. The bequest motive is therefore already catered for in Switzerland.

viii) Universal health cover in Switzerland is very comprehensive and involves reasonably small contributions. It partially covers long-term care as well, with additional state support if necessary. Hence, additional savings for health-related expenses are not necessary.

ix) Voluntary tax-effective savings with flexible withdrawal options are possible (third pillar).

x) Annuitisation offers good value for money.

xi) Very few of the Swiss obtain financial advice as this profession is not well developed in Switzerland.

4.5.3 Summary from the case studies

Explanations have been given for the high rates of annuitisation documented in Chile and Switzerland. It seems that appropriate regulatory constraints, for example in terms of pay-out choices and annuitisation as the default annuity strategy, partly explain high annuitisation rates. In addition, regulatory incentives in the form of guaranteed (or life) annuity guarantees, as well as assistance from well incentivised life insurance brokers who market aggressively, undoubtedly give good-value-for-money guaranteed annuities a competitive edge over phased withdrawals. Finally, a system that innovatively caters for bequest motives and health expenditure shocks makes guaranteed annuities an attractive choice.

4.6 SATISFACTION LEVELS IN RETIREMENT

There seems to be very little international research focusing on the effect of retirement income strategies on satisfaction levels. Most notably, Panis (2004), Bender and Jivan (2005) as well as more recently, Nyce and Quade (2012), empirically investigated the effect of a guaranteed lifetime income stream on retirement satisfaction levels. A guaranteed lifetime income stream in these studies refers mostly to defined benefit pension pay-outs, and only in some cases are guaranteed annuities included.

[148] Housing rent as well as interest on mortgage payments are partially tax-deductible.

4.6.1 Panis (2004)

Using mainly 2000 wave[149] HRS data from almost 20 000 respondents in a multi-variate analysis, Panis (2004) found that very few retirees aged 51 years and older rely on a guaranteed annuity income stream for life, with specific reference to defined benefit pension pay-outs and Social Security payments. He used several measures of satisfaction in retirement.

Firstly, respondents *described their retirement years*, in comparison with the years before retirement, as either better, about the same, or not as good. Reality equated or exceeded expectations for most retirees.[150]

Secondly, the respondents' *general levels of satisfaction* were measured by asking respondents if their retirement turned out to be very satisfying, moderately satisfying, or not satisfying at all. The evidence conclusively showed that the more people can count on guaranteed lifetime income streams, the more satisfied they were in retirement; also they maintained their satisfaction throughout, whereas those without the security of a reliable and consistent annuity income stream tended to become less satisfied as time passed. Greater satisfaction of annuitants with a dependable income stream is ascribed to reduced anxiety about the risks of outliving retirement savings and ending up in poverty.

Panis (2004) also showed that individuals in better health with more financial resources tend to be more satisfied in retirement. Older retirees, as well as those who are married expressed greater levels of satisfaction than the younger cohorts and those who are either divorced/separated, or widowed. Those who were never married showed higher levels of satisfaction than those previously married, but now divorced/separated, or widowed.

Moreover, more risk-averse individuals were more satisfied in retirement than those who were risk tolerant. Satisfaction levels were also higher for individuals who engaged in financial planning activities and had health insurance in place.

In addition to satisfaction levels, depression symptoms were used to measure wellbeing in retirement. Thus, in the final question, *mental health* was established, similar to the Center for Epidemiologic Studies Depression (CES-D) scale (Radloff, 1977), which is based on 20 self-reported questions designed to assess symptoms of depression. Panis (2004) used the shortened version of nine questions administered by the HRS. The score was calculated by assigning a one to every 'yes' for the six items that expressed negative feelings, and to every 'no' for the three items that expressed positive feelings. The composite score ranged from zero (i.e. no signs of depression) to nine

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[149] However, in some instances a subset of HRS data was used from previous waves (i.e. biennial data from 1992 to 1998).

[150] Panis (2004) (pre-retirement) respondents were also asked what they thought would happen to their standard of living once they were retired. More than half of the respondents thought it would be more or less the same as pre-retirement.

(i.e. strong signs of depression). The same patterns emerged as with satisfaction levels, with a few exceptions. Although men and women experienced the same satisfaction levels in retirement, women were found to experience more depression symptoms than men. Also, older retirees experienced more symptoms of depression than the younger cohorts, except for very young retirees.

4.6.2 Bender and Jivan (2005)

Bender and Jivan (2005) also performed statistical analysis on the 2000 wave of HRS data. The same variables were used as in Panis (2004) to measure retirement wellbeing, i.e. “Thinking about your retirement years compared to the years just before you retired, would you say the retirement years have been better, about the same, or not as good?” and “All in all, would you say that your retirement has turned out to be very satisfying, moderately satisfying, or not at all satisfying?”.

They found that although economic wellbeing (as measured by income and wealth) increased overall wellbeing,[151] the effect was relatively small. As confirmed in Panis (2004), having a defined benefit plan had a positive impact on the wellbeing of retirees, compared to having no pension or even just a DC plan. Wellbeing was mostly affected by whether individuals voluntarily retired, or not. Those who decided when to retire of their own free will, expressed much higher levels of wellbeing compared to those who were compelled to retire.

Panis’ result (2004), that health was the second most important factor that contributed to overall wellbeing, was echoed by Bender and Jivan’s finding (2005). Also, having health insurance, as in Panis’ (2004) study, contributed positively to retirees’ wellbeing.

4.6.3 Nyce and Quade (2012)

Nyce and Quade (2012) performed various statistical analyses (including a logistic regression analysis) on similar HRS data (seven survey waves from 1998 to 2010) used by Panis (2004) and Bender and Jivan (2005). Also, similar to the studies of Panis (2004) and Bender and Jivan (2005), the respondents’ general levels of satisfaction were measured by asking respondents if their retirement turned out to be very satisfying, moderately satisfying, or not satisfying at all. While the primary source of annuity income for most survey participants came from a defined benefit plan, some had purchased an annuity contract through an insurance company.

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[151] As was the case in Panis’ (2004) study.

Nyce and Quade's key findings mirror those by Panis (2004), as well as Bender and Jivan (2005), as follows:

i) Retirees who are wealthy, healthy and receive a consistent pension for life were most satisfied;
ii) Retirement satisfaction had steadily declined over the survey period;
iii) Among retirees with similar wealth and health characteristics, those who receive a guaranteed annuity income stream for life were happiest;
iv) Dependable and secure pension pay-outs provided the biggest improvement in satisfaction to retirees with less wealth and those in poor health;
v) The satisfaction effects of a predictable and guaranteed pension income were long-lasting and extended across all respondents.

Nyce and Quade (2012) also found, similar to Panis (2004) as well as Bender and Jivan (2005), that older retirees and those who are married, expressed greater levels of satisfaction than the younger cohorts who are single. Also, as in the studies by Panis (2004) and Bender and Jivan (2005), Nyce and Quade (2012) showed that satisfaction did not differ substantially between men and women.

4.6.4 Other retirement satisfaction literature

Other international studies that researched retirement satisfaction levels directly, although not with reference to a specific annuity income strategy, include those of Shultz, Morton and Weckerle (1998), Elder and Rudolph (1999), and Bender (2004).

Shultz et al. (1998) examined the relative importance of "push" (e.g. poor health) versus "pull" (e.g. leisure) factors on retirement satisfaction. Their sample consisted of the first wave (1992) of the HRS. By performing a discriminant function analysis with a sample of 827 early retirees, they found that push factors were more important for those who were obligated to retire, whereas pull factors tended to be more important to those who retired on their own accord. In their statistical analysis they focused on the voluntariness of young retirees.

Elder and Rudolph (1999) also used the first wave (1992) of HRS data to examine the role of financial planning and expectations on the retirement satisfaction of approximately 1 800 retirees by performing a regression analysis. They found a strong positive correlation between retirement planning and eventual retirement satisfaction. However, involuntary retirement was negatively correlated with retirement satisfaction (Elder & Rudolph, 1999).

Bender (2004) examined the determinants of overall retiree wellbeing, by using 2000 HRS data. The sample consisted of two groups, namely: (i) a retirement satisfaction sample consisting of 6 246 respondents; and (ii) a retirement comparison sample consisting of 6 085 respondents. By performing various regression analyses, they found the reason for retirement to be the strongest predictor for retirement wellbeing. In this way, retirees' wellbeing was higher if their retirement was

voluntary, as opposed to retirees who had been forced to retire. Also health, current income, and retirement comparison income[152] played an important role in retiree wellbeing (Bender, 2004).

4.7 SUMMARY

Contrary to the prescriptions of economic thinking, very few people avail themselves of the benefits that guaranteed annuitisation provides. Scholars have been grappling with this issue for several decades, which has resulted in a substantial body of literature that seeks to resolve the puzzling phenomenon of why so few retirees choose to protect themselves against investment and longevity risk.

By reviewing international research (including informal evidence), the factors that could potentially account for the annuity puzzle were established and include: (i) the desire to leave a bequest to heirs at death in the form of remaining retirement capital; (ii) unfairness with respect to the mechanics of how guaranteed annuities are structured and priced; (iii) pre-annuitised wealth (not relevant in the South African context); (iv) formal or informal contracts according to which the longevity and investment risks associated with the living annuity strategy, are carried by family members (or spouses) in the expectation of inheriting the annuitant's remaining capital at death; (v) the small but potentially disastrous effect of life insurance companies defaulting on guaranteed annuity payments; (vi) interest rates in the economy, based on which guaranteed annuity rates are calculated; (vii) the desire for flexibility and control over retirement capital; and (viii) the lack of awareness and education on the unequivocal benefits of annuitisation. Finally, cognitive biases present in real-life decision-making were explored as possible resolutions to the annuity puzzle.

Factors that influence people's real annuity choices were also investigated and case studies of countries with high annuitisation rates were explored. The chapter concluded with an analysis of the satisfaction levels of retirees with respect to their choice of an AIP.

Most of these existing research studies were conducted in the setting of the standard life-cycle model of utility maximisation, in some cases also accompanied by conclusions based on empirical observations. In this dissertation, an attempt is made to contribute to the existing annuity puzzle literature by conducting an empirical investigation into the factors that relate to annuity perception, intention and satisfaction. In doing so, it is hoped that our understanding of how people actually make annuity decisions will be deepened. As most of the existing research studies on annuity decision-making have been conducted in the context of the developed world, an addition will be made to the annuity decision-making literature in the context of a developing country, namely South Africa.

The next chapter describes the research design and methodology followed to conduct this study.

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[152] Pension income received by other retirees.

CHAPTER 5:
RESEARCH DESIGN AND METHODOLOGY

5.1 INTRODUCTION

This chapter presents the research plan followed to execute the research study. Section 5.2 to Section 5.4 present the problem statement, research questions and research objectives. Section 5.5 introduces the process followed to identify the factors that relate to annuity decision-making, which serves as a roadmap/framework against which the development of variables is discussed. Section 5.6 identifies and describes the population and sample of the study. Section 5.7 discusses the data collection method and measurement instrument used, by elaborating also on the process followed to pre-run the questionnaire for Part 1. Section 5.8 describes how the integrity of the data was ensured. Section 5.9 expands on the data processing techniques utilised to analyse the data, followed in Section 5.10 with a scope for the study, by setting certain boundaries. Section 5.11 summarises this chapter.

5.2 PROBLEM STATEMENT

Contrary to the prescriptions of economic theory, observed levels of annuitisation are generally significantly lower than those considered optimal by most economists (Milevsky, 2013: 94). This international phenomenon, dubbed the ‘annuity puzzle’, seems to apply especially in the South African context, as the demand for living annuities is increasing, while the demand for guaranteed annuities is declining (National Treasury, 2012: 4-5). The annuity puzzle is a central policy concern of our time as it may hold the adverse economic implication that many retirees outlive their retirement capital, which in turn may lead to increased reliance on the state for financial support.

In addition, in light of anticipated proposals for retirement reform, as well as the continued shift away from defined benefit (DB) to defined contribution (DC) retirement funds, it is a widely-held belief among scholars and government alike, that a better understanding of the annuity puzzle is essential, as the future financial security of retirees depends on it (Blitzstein et al., 2006: 8). Furthermore, recent flat share market returns as delivered by the JSE All Share Index (ALSI) from 2016 to the present time (January 2021), as well as longer life expectancies of retirees due to medical innovation, have focused policy-makers’ attention on the vulnerability of future retirees to investment and longevity risk.

5.3 RESEARCH QUESTIONS

As derived from the problem statement, this study attempted to answer the following research questions:

i) Which factors relate to the pre-retirement *benefit perceptions* of annuities?

ii) Which factors relate to the *intention to annuitise* retirement capital? and

iii) Which factors are associated with *satisfaction levels* as they relate to the eventual outcome of the AIP choice?

This study therefore strives to join the academic debate on the intriguing annuity puzzle, and makes a meaningful contribution by exploring the factors that relate to annuity decision-making.

5.4 RESEARCH OBJECTIVES

The *primary objective* this study was to investigate the factors that relate to annuity decision-making. In order to achieve the primary objective, the *secondary objective* of this study was threefold: (i) to identify the factors that relate to an individual's benefit perceptions who intended to purchase either a living or a guaranteed annuity respectively (before retirement); (ii) to identify the factors that relate to an individual's intention to annuitise, or not before he/she reaches retirement; and (iii) to identify the factors that associate with retirees' satisfaction levels[153] with respect to the eventual outcome of their annuity choice.

This study consists of two parts that follow logically on each other with regards to the annuity decision-making timeline. The parts of this study run concurrently with distinctive samples that are independent from one another. As is graphically depicted in Figure 5.1, the study comprised:

- Part 1: Annuity perceptions and intention to annuitise, or not; and
- Part 2: Satisfaction levels as they relate to the eventual outcome of the annuity choice.

[153] According to the substantial body of literature on the standard life-cycle model of consumption-saving behaviour, utility maximisation is achieved when a substantial portion of retirement wealth is annuitised (For a discussion, see Section 4.2).

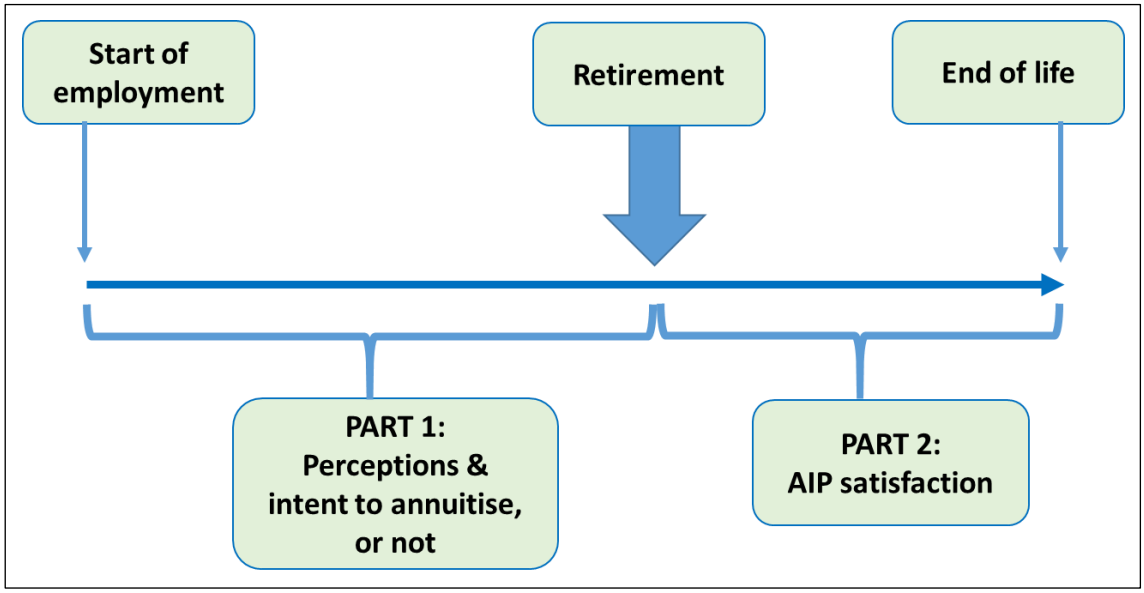

Figure 5.1: Annuity decision-making timeline

Source: Author's conception.

5.4.1 Part 1: Annuity benefit perceptions and intention to annuitise, or not

The first part of the timeline refers to members of DC retirement funds, who must make an annuity decision sometime in the future. As they have not yet reached their retirement, they only have an intention to annuitise, or not. For the purpose of this study, employees who are members of various retirement funds were questioned regarding their annuity perceptions and intentions.

5.4.2 Part 2: Satisfaction levels in retirement as they relate to AIP choice

The second part of the timeline refers to individuals who have already made an annuity decision and are thus fully retired from their respective retirement funds. For the purpose of this study, individuals who already receive annuity income payments were questioned regarding their satisfaction levels as they relate to their annuity choice.

5.5 ESTABLISHING THE FACTORS THAT RELATE TO ANNUITY DECISION-MAKING

In an attempt to meet the primary research objective stated in Section 5.4, the factors that relate to annuity decision-making were identified in the following parts.

i) Part 1(A): The benefit perceptions of living annuities;
ii) Part 1(B): The benefit perceptions of guaranteed annuities;
iii) Part 1(C): The intention to annuitise, or not; and
iv) Part 2: Satisfaction levels in retirement as they relate to the eventual outcome of the AIP choice.

5.5.1 Part 1(A) and (B): Benefit perceptions – dependent variables

In Part 1 of the study, the factors that relate to living and guaranteed annuity benefit perceptions respectively, were investigated.

Benefit perceptions (or perceived value) can be defined as a judgement or a valuation of the comparison between the benefits obtained from an AIP, and the perceived sacrifices or costs (Zeithaml, 1988; Monroe, 1990; Lovelock, 1991; Gale, 1994; Bigné, Moliner & Callarisa, 2000; Teas & Agarwal, 2000). As benefit perceptions refer to the value perceived by the individual/annuitant, it cannot be determined objectively by the seller. Only the individual/annuitant is able to perceive whether or not an AIP offers value (Roig, Garcia, Tena & Monzonis, 2006: 269).

According to Roig et al. (2006: 271-272), the authors who treat the concept of benefit perceptions (or perceived value) as a multi-dimensional construct, agree that two dimensions can be differentiated, namely: (i) a functional dimension; and (ii) an emotional (or affective) dimension. Factors identified in the functional dimension include value for money (Sweeney, Soutar & Johnson; 1999) and expected yield (Sweeney & Soutar, 2001). The affective dimension captures the feelings or emotions elicited by the AIP and is formed by an emotional component, relating to internal emotions or feelings, and a social component, relating to the social impact of the purchase (Sánchez, Callarisa, Rodríguez & Moliner, 2006).

Although the perceived benefit perceptions of annuities in this study were measured by combining three questions, they represent two dimensions, as explained below:

i) The first question (or item) that measures the benefit perceptions of a living (*guaranteed*) annuity is: “A living (*guaranteed*) annuity will give me a fair return on my investment”. This item captures the functional dimension and refers to value for money and expected yield of preferring a certain AIP.

ii) The second question that measures the benefit perceptions of a living (*guaranteed*) annuity is: “A living (*guaranteed*) annuity will give me peace of mind”. This item captures the affective dimension and refers to an internal emotion or feeling elicited by preferring a certain AIP.

iii) The third question that measures the benefit perceptions of a living (*guaranteed*) annuity is: “A living (*guaranteed*) annuity will give me financial security”. This item captures the affective dimension and refers to the social impact of preferring a certain AIP.

Therefore, although the benefit perceptions of living (*guaranteed*) annuities were measured as one construct, both the functional and affective dimensions were addressed by the questions. Although the measurement scale with respect to the individual questions (i) to (iii) refers to ordinal data, they were treated as interval data, as the data was averaged to form the benefit perceptions construct. The factors that relate to the benefit perceptions of living annuities were identified from the data collected from respondents who intended to purchase a living annuity, whereas the factors that relate

to the benefit perceptions of guaranteed annuities were identified from the data collected from respondents who intended to purchase a guaranteed annuity.

5.5.2 Part 1(A): Benefit perceptions of living annuities – independent variables

In Part 1(A) of the study, the factors that relate to living annuity benefit perceptions were investigated. The dependent variable therefore refers to the benefit perceptions of living annuities as measured by fair return on investment, peace of mind and financial security. The three items were chosen by the researcher to represent the benefit perceptions of living annuities.

The independent variables consist of living annuity characteristics as described in annuity theory and often included in annuity puzzle studies, namely: the bequest motive, managing retirement capital, accessibility (general and retirement capital), mortality salience, trust in financial advisors selling living annuities, and awareness. Mortality risk, risk aversion, patience (general and speed of financial decision-making), financial literacy and insurance were included as independent variables as they are often measured in international empirical studies assessing annuitisation intention and choice (See Section 4.4).

The process of selecting independent variables and questions was grounded in theory by identifying the following: (1) independent variable or determinant (D), which refers to the factor that could potentially relate to living annuity perception; (2) hypothesised effect (HE) which refers to the expected way in which the determinant is likely to relate to living annuity perception; (3) variable used as proxy (VUAP), which refers to the variable used to represent the independent variable or determinant; and (4) rationale (R), which refers to an explanation of the hypothesised effect as informed by theory and previous empirical studies. Finally, references were made to the relevant sections in the dissertation as they relate to (1) to (4).

Table B.1 (Appendix B) refers to the process followed to select the independent variables (or constructs) and questions used to identify the factors that relate to the benefit perceptions of living annuities. From the independent variables and questions selected in Appendix B, a theoretical framework was developed for Part 1(A) of the study as is graphically depicted in Figure 5.2.

The blue shape represents the dependent variable, the green shapes represent the independent variables, whereas the grey shapes represent the questions (or items) used to measure each independent variable. The arrows in the figures are for illustrative purposes only and do not imply a directional causal relationship between the variables and items.

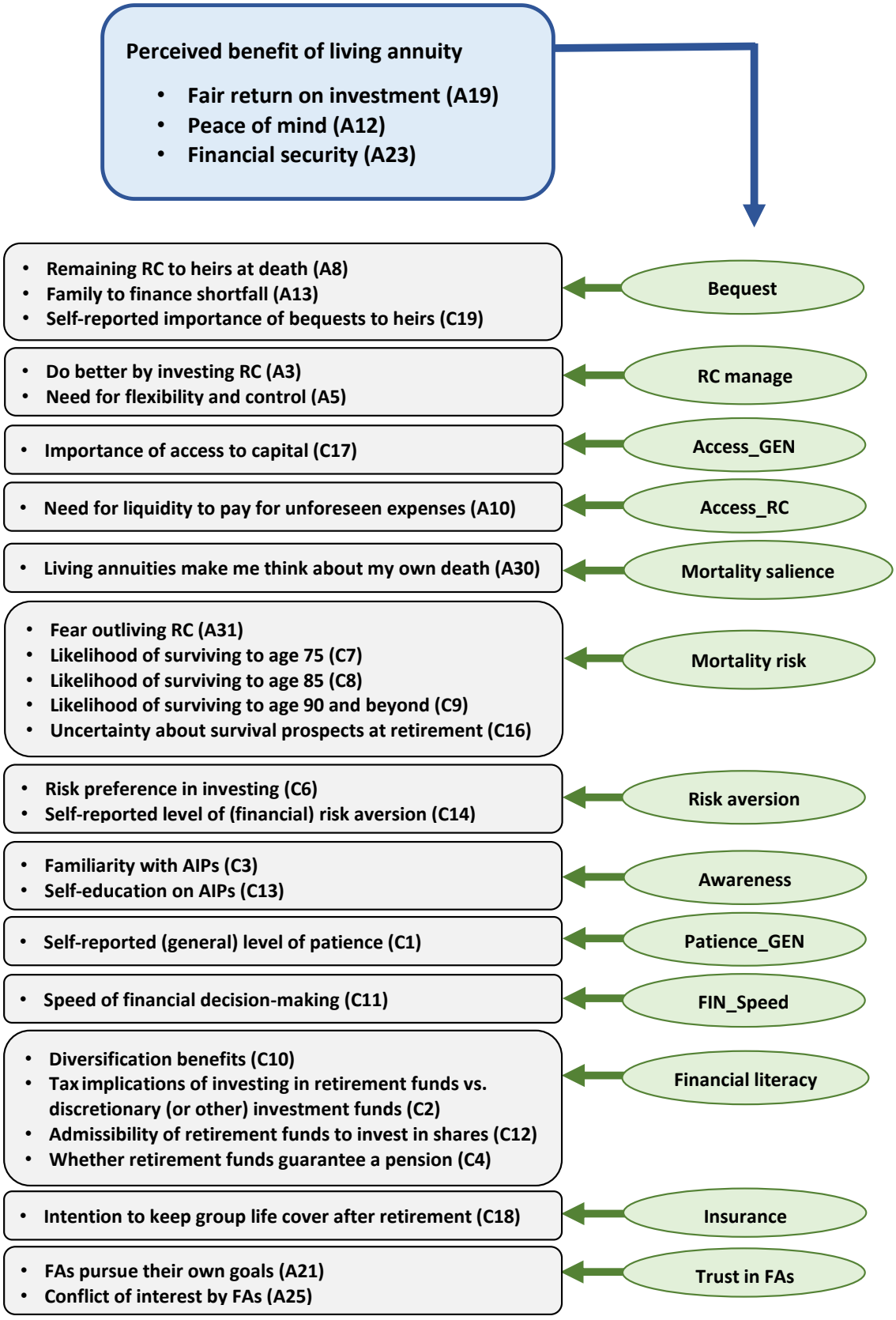

Figure 5.2: Part 1(A): Theoretical framework for living annuity benefit perceptions: Dependent and independent variables

Source: Author's conception.

The numbering in brackets (e.g. A8) after each item (e.g. whether respondents think it is important to leave remaining capital to their heirs at death) that was used to measure an independent variable/factor/scale (e.g. bequest motive) refers to the section and question number in the MS Word questionnaire (see Appendix C). YES/NO questions, as well as other questions covering demographic variables were not included in the figures, as they were analysed separately.[154]

The performance of the theoretical framework illustrated in Figure 5.2, was empirically tested in Part 1(A) of the study (See Chapter 6). This framework represents the independent variables included after a measurement reliability analysis was performed on the data collected in Part 1 (See Section 6.3). A measurement reliability analysis was conducted due to the exploratory nature of Part 1 of the study and the absence of validated scales.

5.5.3 Part 1(B): Benefit perceptions of guaranteed annuities – independent variables

In Part 1(B) of the study, the factors that relate to guaranteed annuity benefit perceptions were investigated. The dependent variable refers to the benefit perceptions of guaranteed annuities as measured by fair return on investment, peace of mind and financial security. The three items were chosen by the researcher to represent the benefit perceptions of guaranteed annuities.

The independent variables consist of guaranteed annuity characteristics contained in annuity theory as well as annuity puzzle literature, namely: fairness; certainty; default risk (survive and diverse); mortality salience; trust in financial advisors selling guaranteed annuities; and awareness. Mortality risk, risk aversion, patience (general and speed of financial decision-making), financial literacy and insurance were included as independent variables as they are often measured in international empirical studies assessing annuitisation intention and choice (See Section 4.4).

The process of selecting independent variables and questions was grounded in theory by identifying the following: (1) independent variable or determinant (D), which refers to the factor that could potentially relate to guaranteed annuity perception; (2) hypothesised effect (HE) which refers to the expected way in which the determinant is likely to relate to living annuity perception; (3) variable used as proxy (VUAP), which refers to the variable used to represent the independent variable or determinant; and (4) rationale (R), which refers to an explanation of the hypothesised effect as informed by theory and previous empirical studies. Finally, references were made to the relevant sections in the dissertation as they relate to (1) to (4).

[154] Not Likert-scale questions.

Table B.2 (Appendix B) refers to the process followed to select the independent variables (or constructs) and questions used to identify the factors that relate to the benefit perceptions of guaranteed annuities. From the independent variables and questions selected in Appendix B, a theoretical framework was developed for Part 1(B) of the study as is graphically depicted in Figure 5.3.

The blue shape represents the dependent variable and the green shapes represent the independent variables, whereas the grey shapes represent the items used to measure each independent variable. The arrows in the figures are for illustrative purposes only and do not imply a directional causal relationship between the variables and items.

The numbering in brackets (e.g. A8) after each item (e.g. whether respondents think it is important to leave remaining capital to their heirs at death) that was used to measure an independent variable/factor/scale (e.g. bequest motive) refers to the section and question number in the MS Word questionnaire (see Appendix C). YES/NO questions, as well as other questions covering demographic variables were not included in the figures, as they were analysed separately.[155] The performance of the theoretical framework illustrated in Figure 5.3, was empirically tested in Part 1(B) of the study (See Chapter 6).

This framework represents the independent variables included after a measurement reliability analysis was performed on the data collected in Part 1 (See Section 6.3). A measurement reliability analysis was conducted due to the exploratory nature of Part 1 of the study and the absence of validated scales.

[155] Not Likert-scale questions.

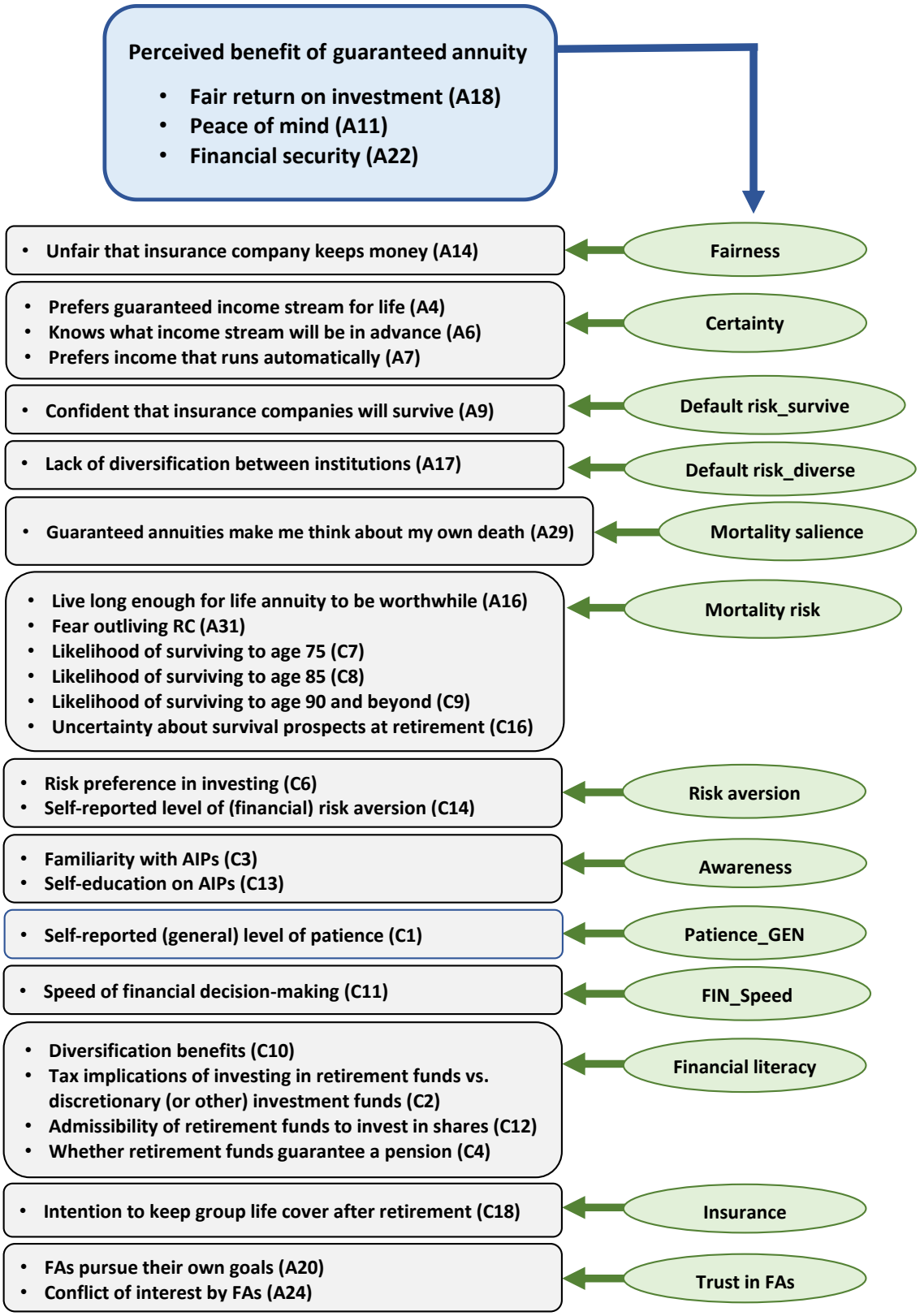

Figure 5.3: Part 1(B): Theoretical framework for guaranteed annuity benefit perceptions: Dependent and independent variables

Source: Author's conception.

5.5.4 Part 1(C): Intention to annuitise – dependent and independent variables

In Part 1(C) of the study, the factors that relate to the intention to annuitise were investigated.

The dependent variable refers to the intention to annuitise, or not. Respondents therefore had to choose between a living annuity and a guaranteed annuity. The independent variables consist of the factors that measure both living and guaranteed annuity benefit perceptions (See Section 5.5.2 and Section 5.5.3).

The process of selecting independent variables and questions was grounded in theory by identifying the following: (1) independent variable or determinant (D), which refers to the factor that could potentially relate to annuitisation intent; (2) hypothesised effect (HE) which refers to the expected way in which the determinant is likely to relate to annuitisation intent; (3) variable used as proxy (VUAP), which refers to the variable used to represent the independent variable or determinant; and (4) rationale (R), which refers to an explanation of the hypothesised effect as informed by theory and previous empirical studies. Finally, references were made to the relevant sections in the dissertation as they relate to (1) to (4).

Table B.3 (Appendix B) refers to the process followed to select the independent variables (or constructs) and questions used to identify the factors that relate to the intention to annuitise, or not. From the independent variables and questions selected in Appendix B, a theoretical framework was developed for Part 1(C) of the study as is graphically depicted in Figure 5.4. The blue shape represents the dependent variable and the green shapes represent the independent variables, whereas the grey shapes represent the items used to measure each independent variable. The arrows in the figures are for illustrative purposes only and do not imply a directional causal relationship between the variables and items.

The numbering in brackets (e.g. A8) after each item (e.g. whether respondents think it is important to leave remaining capital to their heirs at death), that was used to measure an independent variable/factor/scale (e.g. bequest motive), refers to the section and question number in the MS Word questionnaire (see Appendix C). YES/NO questions, as well as other questions covering demographic variables were not included in the figures, as they were analysed separately.[156]

The performance of the theoretical framework illustrated in Figure 5.4, was empirically tested in Part 1(C) of the study (See Chapter 6). This framework represents the independent variables included after a measurement reliability analysis was performed on the data collected in Part 1 (See Section 6.3). A measurement reliability analysis was conducted due the exploratory nature of Part 1 of the study and the absence of validated scales.

[156] Not Likert-scale questions.

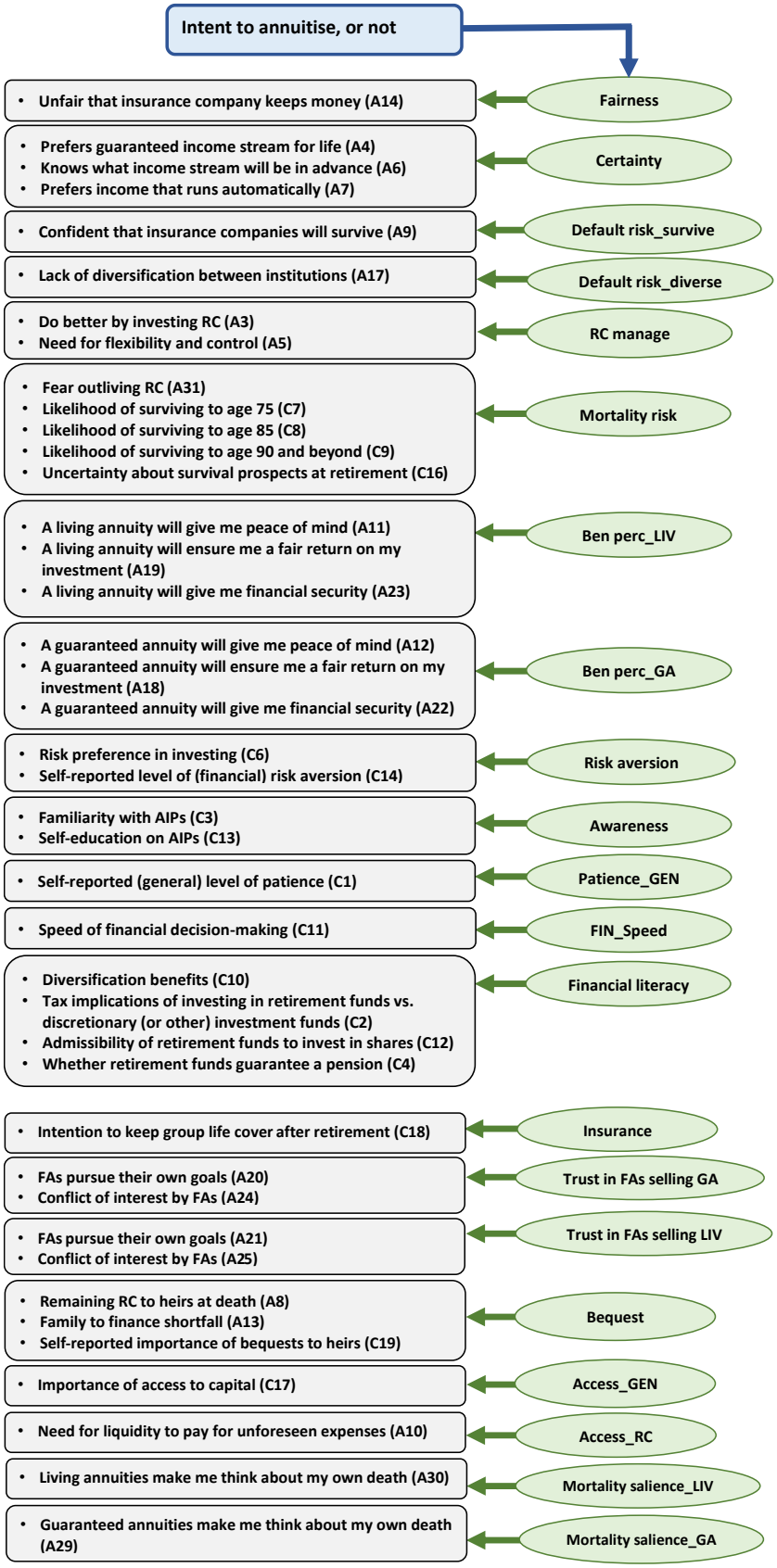

Figure 5.4: Part 1(C): Theoretical framework for intention to annuitise: Dependent and independent variables

Source: Author's conception.

5.5.5 Part 2: Satisfaction (LIV) – dependent and independent variables

In Part 2 of the study, the factors that are associated with annuitant satisfaction levels as they relate to the outcome of their AIP choice were investigated. Only the data collected from living annuitants were analysed.

The dependent variables refer to living annuitant satisfaction levels as they relate to the eventual outcome of AIP choice, and were measured by eight items, namely: AIP satisfaction; feelings of regret towards AIP choice; would choose different AIP; change AIP in future; and feel anxious/comfortable/hopeful/worry about financial future.[157] The satisfaction levels of living annuitants were empirically measured in this study as an overarching construct, consisting of the preceding eight questions. Although the measurement scale with respect to the individual eight questions refers to ordinal data, it was treated as interval data, as the data was averaged to form the satisfaction construct.

The independent variables refer to living annuity characteristics that could either increase or decrease satisfaction levels in retirement, namely: managing retirement capital; the bequest motive; accessibility (general and retirement capital); awareness (general and living annuities specifically); influence to choose a living annuity;[158] post-benefit perceptions of a living annuity;[159] trust in advisor selling living annuities; fear of outliving retirement capital; and mortality salience. Mortality risk estimation, patience (general and speed of financial decision-making), financial literacy and risk aversion were included as independent variables as they are often measured in international empirical studies assessing annuitisation intent, choice and satisfaction (See Section 4.4 and 4.6).

The process of selecting independent variables and questions was grounded in theory by identifying the following: (1) independent variable or determinant (D), which refers to the factor that could potentially be associated with AIP satisfaction levels; (2) hypothesised effect (HE), which refers to the expected way in which the determinant is likely to be associated with AIP satisfaction levels; (3) variable used as proxy (VUAP), which refers to the variable used to represent the independent variable or determinant; and (4) rationale (R), which refers to an explanation of the hypothesised effect as informed by theory and previous empirical studies. Finally, references were made to the relevant sections in the dissertation as they relate to (1) to (4).

Table B.4 (Appendix B) refers to the process followed to select the independent variables and questions used to identify the factors that associate with AIP satisfaction levels. From the independent variables and questions selected in Appendix B, a theoretical framework was developed for Part 2 of the study as is graphically depicted in Figure 5.5.

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[157] These items are derived from the study by Panis (2004).

[158] This item was not included in Part 1 as respondents have not yet made an AIP choice.

[159] This item was referred to as benefit perceptions in Part 1.

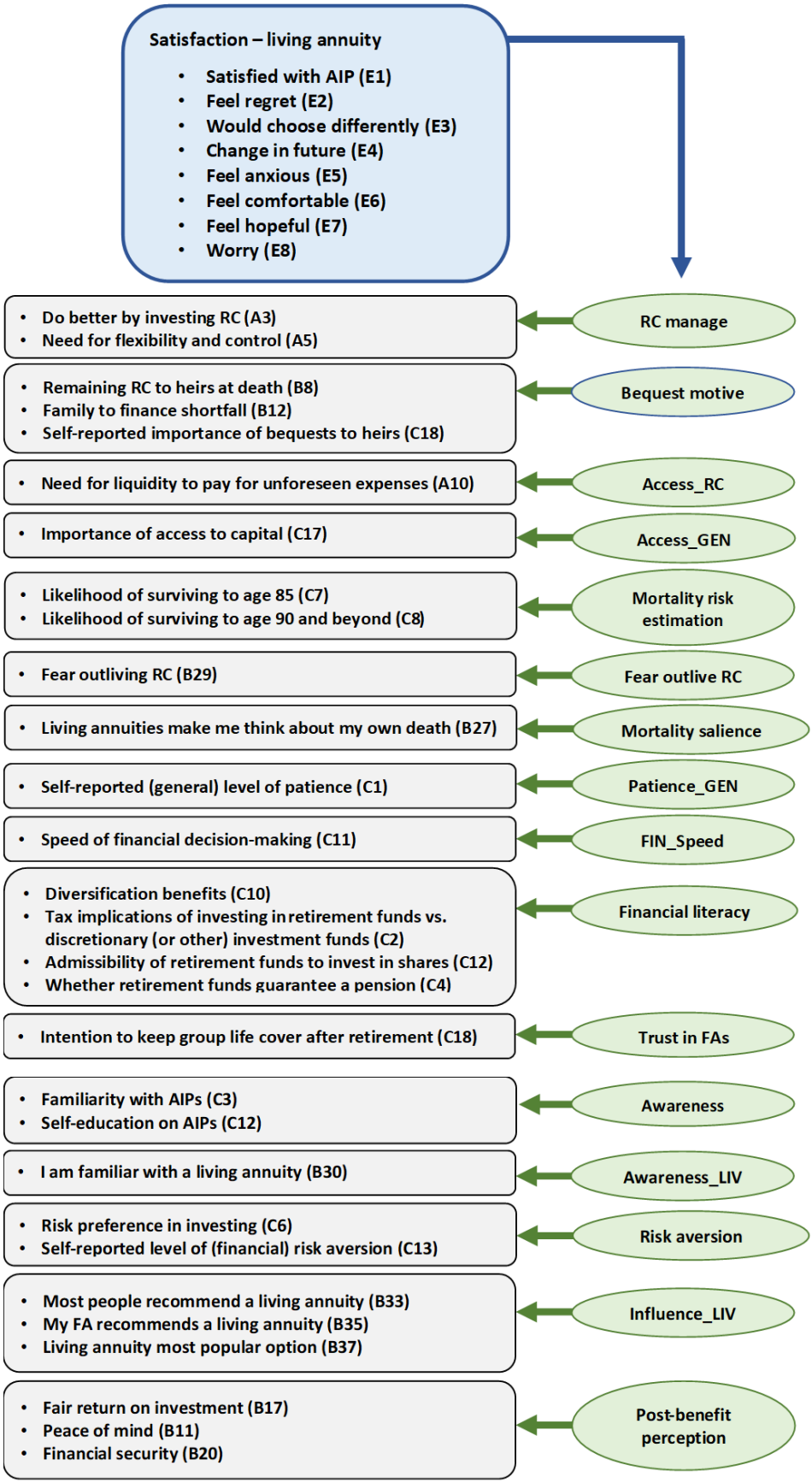

Figure 5.5: Part 2: Theoretical framework for living annuitant satisfaction levels: Dependent and independent variables

Source: Author's conception.

Figure 5.5 shows the dependent variable for Part 2, i.e. retirees' satisfaction levels, as well as the items used to measure each independent variable.[160] The blue shape represents the dependent variables and the green shapes represent the independent variables, whereas the grey shapes represent the items used to measure each independent variable. The numbering in brackets (e.g. A8) after each item (e.g. whether respondents think it is important to leave remaining capital to their heirs at death) that was used to measure an independent variable/factor/scale (e.g. bequest motive) refers to the section and question number in the MS Word questionnaire (see Appendix C). YES/NO questions, as well as other questions covering demographic variables were not included in the figures, as they were analysed separately.[161]

The performance of the theoretical framework illustrated in Figure 5.5 was empirically tested in Part 2 of this study (See Chapter 7). This theoretical framework represents the independent variables included after a measurement reliability analysis was performed on the data collected in Part 2 (See Section 7.2). A measurement reliability analysis was conducted due the exploratory nature of Part 2 of the study and the absence of validated scales.

5.6 POPULATION AND SAMPLE

The target population for the study was (i) current employees permanently employed in the formal sector and who are members of their employers' DC retirement funds as a condition of employment (Part 1); and (ii) individuals currently in receipt of either living or guaranteed annuity income payments, or a combination of both living and guaranteed annuity income payments (Part 2).

As it was not feasible to gain access to the target population as a whole, people were sampled[162] from retirement funds and an investment house to participate in the study. The disadvantage of convenience (or non-probability) sampling as was employed in this study, is the inability to generalise study findings to the target population. For instance, people who were more interested in the annuity puzzle, and who were more financially literate, could have been more inclined towards participating in the study, whereas people who were less interested in the annuity puzzle, and who were less financially literate, could have been less motivated to partake.

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[160] The depiction in Figure 5.5 consists only of independent variables as they relate to living annuities, due to an insufficient sample size with respect to the other two annuity income options, namely annuitisation and the blended option.

[161] Not Likert-scale questions.

[162] Samples are used to make inferences about target populations.

Part 1: The sample for Part 1 of the study consisted of two sub-samples in order to be as representative as possible of the target population, namely: (i) employees of Stellenbosch University (SU) who are members of the University of Stellenbosch Retirement Fund[163] (USRF); and (ii) employees of Exxaro who are members of the Exxaro Retirement Funds.

Part 2: The sample for Part 2 of the study consisted of two sub-samples in order to be as representative as possible of the target population, namely: (i) former employees of SU, who are fully retired from the USRF; and (ii) Glacier annuity clients, who receive either living or guaranteed annuity income payments, or a combination of both living and guaranteed annuity income payments.

The respective sub-samples are discussed in greater detail, as follows:

i) **Stellenbosch University (SU).** SU is a public research university situated in Stellenbosch, a town in the Western Cape province of South Africa. In Part 1 of the study, the sample consisted of 213 SU employees who are members of the USRF. The average age with respect to the SU sample was 53.2 years, and 67% of the employees reported to be higher-middle income to high income earners. Of the total SU sample in Part 1, 94% of the employees had at least one certificate/diploma/degree.

   In Part 2 of the study, the sample consisted of 44 SU pensioners. The average age with respect to the SU pensioners was 69.7 years, and 80% of them reported to be in the higher-middle income to higher income bracket. Of the total SU sample in Part 2, 98% of the pensioners had at least one certificate/diploma/degree.

ii) **Exxaro.** Exxaro is a large black-empowered coal and heavy minerals mining company headquartered in Centurion, a town in the Gauteng province of South Africa. Exxaro has business interests all over the world. In Part 1 of the study, the sample consisted of 98 Exxaro employees who are members of the Exxaro Retirement Funds. The average age with respect to the Exxaro sample was 43.7 years, and 64% of the employees reported to be higher-middle income to higher income earners. Of the total Exxaro sample in Part 1, 88% of the employees had at least one certificate/diploma/degree.

iii) **Glacier.** Glacier is a leading investment and financial planning institution with headquarters in Bellville, a town in the Western Cape province of South Africa. Glacier is a subsidiary of Sanlam, which is regarded as one of the biggest insurance groups globally. In Part 2 of the study, the sample consisted of 259 Glacier annuitants.[164] The average age with respect to the Glacier sample was 71.7 years, and 64% of the annuitants reported to be in the higher-middle income to high income brackets. Of the total Glacier sample, 85% of the annuitants had at least one certificate/diploma/degree.

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[163] The USRF sample consisted of individuals aged 40 and older who were not yet retired.

[164] Holders/owners of Glacier AIPs.

5.7 DATA COLLECTION AND MEASUREMENT INSTRUMENT

In order to identify the factors that relate to annuity decision-making as it pertains to annuity perceptions, intention and satisfaction, cross-sectional (as opposed to longitudinal) primary data was collected by conducting survey research among a group of target respondents.[165] Online questionnaires[166] were constructed using a software survey programme, called Qualtrics. To minimise the effects of non-response bias, surveys were distributed by asking the principal officer of each retirement fund (as opposed to the researcher herself, who most of the members do not know) to send a short letter to invite retirement fund members and annuitants to participate in the study. For Glacier clients, however, the Head of Client Services sent the invitation letter to annuity holders. For a copy of the invitation letters sent to participants for Part 1 and Part 2 of the study, as well as a link to the survey, see Appendix A.[167] The final questionnaire for Part 1 was subjected to a pre-test, mainly as a practice run for using the Qualtrics survey software programme (See Section 5.7.2).

5.7.1 The development of the questionnaire in Part 1

The questionnaire for Part 1 of the study built on previous studies conducted on an individual's intention to annuitise.[168] The questionnaire started by informing participants that they must convert their retirement capital into an income stream at retirement, by choosing either a living annuity or a guaranteed annuity. The key characteristics illustrating each option were pointed out.

Then, certain decision-making factors or independent variables, grounded in annuity puzzle theory, were measured in order to identify the factors that may relate to respondents' decision-making, by using a seven-point Likert scale[169] (1 meant strongly disagree and 7 meant strongly agree). For example, in order to assess whether the bequest motive (independent variable) relates to individuals' decision-making, respondents had to indicate whether they agree/disagree with the following statement: "At death, it is essential to leave my remaining retirement capital to my heirs". Other statements in the section related to several other living and guaranteed annuity characteristics, either directly or indirectly.

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[165] Questionnaires are useful in measuring behaviour (intended, present or past), demographic characteristics, level of knowledge, as well as attitudes, opinions and satisfaction levels (Hawkins & Mothersbaugh, 2013).

[166] Online surveys are highly cost effective, fast and easy to conduct.

[167] The questionnaires for Part 1 and Part 2 of the study are provided in MS Word in Appendix C.

[168] A hypothetical question was asked and used as dependent variable as in Brown (2001), Gardner and Wadsworth (2004), as well as Cappelletti et al. (2013).

[169] With a Likert scale, respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale for a series of statements. The range therefore captures the intensity of respondents' feelings for a given item. This psychometric scale is often used in research employing surveys/questionnaires (Hawkins & Mothersbaugh, 2013: 728).

Next, respondents were asked to choose either a guaranteed or living annuity at their planned retirement.[170] Respondents could only choose one option. The dependent variable is therefore binary as the respondent could choose either the annuitisation or the self-annuitisation route. It was not expressly stated in the questionnaire that a living annuity could be converted to a guaranteed annuity, but not *vice versa*.[171] In most of the empirical studies conducted on annuity choice (See Section 4.4), annuitisation had usually been compared to a cashing-out option. In this study, annuitisation was compared to a living annuity product specifically.

Subsequent questions sought to measure independent variables, such as consumer awareness and education, patience,[172] risk aversion, and financial literacy.[173] Questions to measure these variables were derived from the Health and Retirement Study (HRS; see footnote 91) and the Survey of Household Income and Wealth (SHIW; see footnote 137). Statements in this section did not specifically relate to living or guaranteed annuity characteristics.

The questionnaire concluded with demographic variables, often used in empirical annuitisation studies. The measurement scale for demographic variables refers to nominal and ordinal data. See Appendix C for the questionnaire in MS Word.

5.7.2 Pre-run of questionnaire in Part 1

The final questionnaire for Part 1 was subjected to a pre-test, mainly as a practice run using the Qualtrics software survey programme. The questionnaire for Part 1 was sent to 30 employees at the Department of Business Management, Stellenbosch University on 19 July 2019. Ten (10) employees completed the survey within the given timeframe.

Qualtrics was used to collect the data. A series of codes was developed for each question[174] and response option[175] as required by Qualtrics, with a corresponding MS Word version (for ease of reference). The details of these conversions are explained in detail in Appendix D.

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[170] The hypothetical question used in this study was derived from Gardner and Wadsworth (2004). In Gardner and Wadsworth (2004) they did not expressly refer to a living annuity product/phased-withdrawal plan, but rather to a scenario where an individual lives off retirement savings.

[171] Such an alternative is also not included in Gardner and Wadsworth (2004).

[172] Time rate of preference is used in international literature as a proxy for patience (Hurd & Panis, 2006: 2 225).

[173] If respondents in Gardner and Wadsworth (2004) chose the option to keep retirement savings to live off in retirement, they were then asked to choose between alternative reasons for not purchasing a guaranteed annuity instead.

[174] See Table D.1 (Appendix D).

[175] See Table D.2 (Appendix D).

5.7.3 The development of the questionnaire in Part 2

Part 2 of this study built on the previous studies conducted on retirees' satisfaction levels as they relate to their annuity choice. Hence, in the second part of this study, retirees had already made their annuity choice, whereas in Part 1 participants only had an intention to annuitise, or not. The parts in this study run concurrently with distinctive samples that are independent from one another. Subsequently, there exists no link between the two parts of the study.

The questionnaire started by elaborating on the two types of annuities, and by describing the key characteristics of each type. Thereafter, in the first question, the respondent was asked if he/she had purchased a living annuity, a guaranteed annuity, or a combination of a living and a guaranteed annuity with his/her retirement fund capital. This first question divided the respondents into three groups, namely: those who had chosen a living annuity; those who had chosen a guaranteed annuity; and those who had chosen a combined strategy including both a living and guaranteed annuity. Unfortunately, due to so few retirees having chosen a guaranteed annuity as part of their retirement income strategy, as is predicted by the annuity puzzle, the realised sample consists only of living annuitants.

Next, certain factors or independent variables, grounded in annuity puzzle theory, were measured in order to identify the factors that associated with respondents' satisfaction levels as they relate to their annuity choice, by using a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree). For example, in order to test whether access to retirement capital in retirement[176] (independent variable) associated with individuals' satisfaction levels, respondents who had chosen a living annuity, indicated whether they agreed/disagreed with the following statement: "A living annuity is desirable as it allows me access to my retirement capital to pay for unforeseen expenses, for example, medical costs or home repairs". Other statements in the section related to various other living and guaranteed annuity characteristics, either directly or indirectly.

The subsequent questions in the questionnaire had been derived from the HRS, SHIW and the English Longitudinal Study of Ageing (ELSA; see footnote 141), and were used as proxies to measure, for example: risk aversion; mortality risk estimation; bequest motive; access (general); influence; patience (general and speed of financial decision-making); consumer awareness and education (general and living annuities specifically); and financial literacy.

Part 2 built on the studies by Panis (2004), Bender and Jivan (2005) as well as Nyce and Quade (2012), by also using several measures of satisfaction in retirement. In the studies by Panis (2004), Bender and Jivan (2005) as well as Nyce and Quade (2012), the respondents' general levels of satisfaction in retirement were measured. In this study, however, respondents' satisfaction level regarding their chosen AIPs was measured.

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[176] Known as the precautionary savings motive in international literature.

Subsequently, three questions were asked to measure/assess the respondents' regret about their decision to annuitise or not and their intention to make changes to their AIPs in the future; this was also not done by Panis (2004), Bender and Jivan (2005), nor Nyce and Quade (2012).

The next four questions are similar to those used by Panis (2004). Mental health was established, similar to the Center for Epidemiologic Studies Depression (CES-D) scale (Radloff, 1977), which is based on 20 self-reported questions designed to assess symptoms of depression. The HRS administers a shortened version of nine questions as was used by Panis (2004).[177] This survey used an even shorter version of only four questions and related specifically to how respondents felt about their financial future. A seven-point Likert scale was used to measure respondents' responses (1 meant strongly disagree and 7 meant strongly agree). Finally, data on demographic variables was collected as derived from the HRS, SHIW and ELSA. The measurement scale for demographic variables refers to nominal and ordinal data. Based on the similarities of questionnaires used in Part 1 and Part 2 of the study, no practice run for the questionnaire used in Part 2 was deemed necessary.

5.8 DATA INTEGRITY

Valid survey data requires a certain level of consistency among a respondent's answers, especially as it relates to questions that measure a common construct/variable. The integrity of the data was therefore confirmed by considering the consistency among respondents' responses with respect to four questions in the questionnaire used in Parts 1 and 2 of the study.

To this end, respondents' responses to the following two questions, as they relate to a living annuity were scrutinised: (i) "At death, it is important to me to leave my remaining retirement capital to my heirs"; and (ii) "It is important to me to leave an inheritance to my heirs at death".

If a respondent's answer to these questions were inconsistent and contradictory, by responding with "somewhat agree", "agree" or "strongly agree" to question (i) and "somewhat disagree", "disagree" or "strongly disagree" to question (ii), the respondent's data was deleted from the dataset. Similarly, if a respondent answered with "somewhat agree", "agree" or "strongly agree" to question (ii) and "somewhat disagree", "disagree" or "strongly disagree" to question (i), the respondent's answers were also eliminated from the dataset.

Similarly, respondents' responses to the following two questions, as they relate to a guaranteed annuity were scrutinised: (i) "I prefer a guaranteed income stream for life"; and (ii) "I prefer to know exactly what my future income stream will be".

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[177] The score was calculated by assigning a one to every 'yes' for the six items that express negative feelings, and a zero to every 'yes' that expresses positive feelings. The composite score ranged from zero (i.e. no signs of depression) to nine (i.e. strong signs of depression).

If a respondent's answers to these questions were inconsistent and contradictory by responding with "somewhat agree", "agree" or "strongly agree" to question (i) and "somewhat disagree", "disagree" or "strongly disagree" to question (ii), the respondent's data was deleted from the dataset. Similarly, if a respondent answered with "somewhat agree", "agree" or "strongly agree" to question (ii) and "somewhat disagree", "disagree" or "strongly disagree" to question (i), the respondent's answers were also eliminated from the dataset. Based on these two criteria, data from 10 respondents in Part 1 and data from 48 respondents in Part 2 was deleted.

5.9 DATA PROCESSING FOR PARTS 1 AND 2

Several methods were utilised to analyse the data to address the research objectives: Cronbach's alpha, multiple regression analysis, logistic regression analysis and bivariate statistical techniques to analyse demographic variables. These methods are discussed in detail in the following sections.

5.9.1 Cronbach's alpha

Due to the exploratory nature of the study and the absence of validated scales, the internal consistency of factors was evaluated after the data was collected, in order to assess measurement reliability. Internal consistency is defined as the degree to which a set of questions measures the same construct/scale (Pallant, 2010: 6). Internal consistency is also referred to as the extent to which the responses for items in a scale correlate with each other (Shelby, 2011: 142). In this study, Cronbach's alpha[178] (CA) was calculated for each construct/scale. Cronbach's alpha is a statistic that measures the internal consistency of constructs measured with multiple items. Conventionally, a CA higher than .70 is desirable and indicates adequate measurement reliability (Nunnally & Bernstein, 1994: 264-265). Also, an inter-item correlation value below .2 could indicate that a specific item measures something else from the scale as a whole (Pallant, 2010: 100).

5.9.2 Multiple regression analysis

In a linear regression, a linear approach is followed to model the relationship between a dependent variable (or response variable) and one or more independent variables (or explanatory variables). A simple linear regression is performed when there is only one independent variable. A standard multiple linear regression is performed when there are two or more independent variables, which are inserted into the model simultaneously.

Multiple linear regression modelling is a suitable technique for investigating complex real-life, as opposed to laboratory-based, research questions and the hypothesised relationships should ideally be based on sound theoretical grounds.

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[178] As developed by Cronbach (1951).

Linear regression analysis is mainly used in practice to realise two goals. Firstly, a linear regression can be used to fit a predictive model to an observed data set. After developing such a model, if additional values of the independent variables are collected without an accompanying response value for the dependent variable, the fitted model can be used to make a prediction about the value of the dependent variable.

Secondly, a linear regression is used to explain the variation in the dependent variable that can be attributed to variation in the independent variables. In this way, it is determined whether the independent variables have a relationship with the dependent variable, and if so, the strength of the relationship is quantified by means of a Beta coefficient (Pallant, 2016: 154-155).

In Part 1 of this study, a multiple regression analysis was performed in SPSS (statistical analysis software) to identify the independent variables (or factors) that relate to the benefit perceptions of living and guaranteed annuities respectively. In Part 2 of this study, a multiple regression was performed in SPSS to identify the independent variables (or factors) that are associated with AIP satisfaction levels. Conducting multiple linear regression analysis is appropriate if continuous (or nearly continuous) data is used to measure the dependent variable and continuous (or nearly continuous) and/or categorical data is used to measure independent variables, as was done in this study. Categorical (or discrete) data consists of nominal and ordinal data.

All the dependent variables and most of the independent variables used in Part 1 and Part 2 of the study were treated as nearly continuous data, as constructs were formed by calculating the mean of two or more ordinal variables (measured by a seven-point Likert scale). A few independent variables were measured as ordinal data (measured by a seven-point Likert scale). Demographic variables (except for age[179]) were measured as categorical data (nominal and ordinal).

The formula for a multiple linear regression line is as follows (Tabachnick & Fidell, 2013: 154):

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i \qquad (5.1)$$

Where:

Y = the dependent variable

a = the Y-intercept or the value of Y when X_i=0

X_i = the independent variable

β_i = the slope (i.e. the extent to which Y changes when X_i increases by one unit).

[179] Measured as continuous data.

Multiple regression analysis relies on several assumptions about the data. Should these assumptions be violated, the validity, and hence the generalisability of the regression results, could be called into question. The assumptions on which multiple regression analysis rests, include the following (Pallant, 2016: 156-168):

i) **Sample size**. According to Stevens (1996: 72), about 15 participants per independent variable are needed to ensure validity, specifically as it relates to research studies in the social sciences. Another sample size requirement or rule of thumb that is often used in practice is six times the number of independent variables, plus 50.

ii) **Outliers and skewness**. An uneven distribution of scores or data points could potentially place doubt on the scientific value of research findings. The presence of outliers should therefore be carefully investigated to ensure validity. According to Tabachnick and Fidell (2013: 128), outliers in the variables can be defined as those with standardised residual values above 3.3 (or less than minus 3.3). It is not always necessary to take action, if only a few outliers are identified.

iii) **Multi-collinearity**. When independent variables are highly correlated (r = .9 and above), regression results may become unreliable. To assess multi-collinearity, two statistical measures are typically examined. Firstly, tolerance values indicate how much of the variability in a specific independent variable is not explained by the other independent variables in the model (1 minus the R squared). Tolerance values below .10 are unacceptable and may indicate multi-collinearity. Secondly, the variance inflation factor (VIF) is the inverse of the tolerance value (1 divided by the tolerance value). A VIF above 10 is unacceptable and points towards multi-collinearity.

iv) **Linear relationship**. Multiple linear regression analysis is based on the assumption that there exists a linear, or near linear relationship between each independent variable and dependent variable.

Statistical metrics that are analysed from the regression results in order to draw inferences from the data, include (Pallant, 2016: 166-168):

i) **R squared.** This measure determines how much of the variance in the dependent variable can be explained by the independent variables.

ii) **Beta coefficient.** The beta coefficient is the slope of the regression line and refers to the extent of change in the dependent variable for one unit of change in the independent variable. The beta coefficient indicates the size of the unique contribution of a specific independent variable to explain the dependent variable, when the variance explained by all the other independent variables in the model is controlled for. In hypothesis testing, the null hypothesis states that the beta coefficient is zero, i.e. there is no relationship between the independent variable and the dependent variable. In comparison, the alternative hypothesis states that there is a relationship between the independent variable and the dependent variable. A directional

alternative hypothesis suggests that the relationship between the independent variable and the dependent variable is either positive or negative.

iii) **The standard error of the estimate (or SE)**. An error or residual term refers to the difference between the actual data points and the regression line. The smaller the SE, the more accurate the beta coefficient.

iv) **P-value and t-statistic**. In order to interpret the beta coefficient, the t-statistic and the associated p-value are examined to ensure scientific validity. Whether a beta coefficient is regarded as statistically significant may be interpreted using the confidence levels/p-values.

v) **F-statistic**. The F-value tests the null hypothesis that the proposed model has no good fit (and the alternative hypothesis that the proposed model has a good fit). For a p-value less than .05, the null hypothesis must therefore be rejected.

5.9.3 Logistic regression analysis

Using a logistic regression, it is assessed how well a set of independent or predictor variables predicts or explains the binary dependent variable. It therefore provides an indication of the adequacy of the theoretical model by assessing "goodness of fit". It also provides information on the relative importance of each predictor variable in the model (Pallant, 2016: 178).

In a multiple regression, the dependent variable is often measured as a continuous variable.[180] However, when the dependent variable is categorical and dichotomous (e.g. yes/no), a binary logistic regression may be a suitable statistical technique to analyse the data (Pallant, 2016: 175).

In logistic analysis, the independent variables can be either continuous or categorical, or a mixture of both. In Part 1 of this study, a binary logistic regression analysis was performed in SPSS to identify the independent variables (or factors) that relate to respondents' intention to annuitise, or not.

Conducting logistic regression analysis is appropriate if the dependent variable is dichotomous, as was the case in Part 1 of this study. Most of the independent variables used in Part 1 of the study were treated as nearly continuous data, as these constructs were formed by calculating the mean of two or more ordinal variables (measured by a seven-point Likert scale). A few independent variables were measured as ordinal data (measured by a seven-point Likert scale). Demographic variables (except for age[181]) were measured as categorical data (nominal and ordinal).

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[180] With a multiple regression the dependent variable should ideally be a continuous variable, with scores reasonably normally distributed (Pallant, 2016: 175).

[181] Measured as continuous data.

Logistic regression analysis is based on various assumptions, including (Pallant, 2016: 176):

i) **Sample size**. Sample size relates to a reasonable number of cases, given the number of predictors in the model. It could be problematic if there are a limited number of cases for a specific category.

ii) **Multi-collinearity**. High correlations between independent variables are not ideal.

iii) **Outliers**. The presence of outliers or cases that are not well explained by the model should be inspected further.

iv) **Linearity of independent variables and log-odds.** Logistical regression analysis requires that the independent variables are linearly related to the log odds.

In this study, the categorical or dependent variables were recoded from their original coding to ensure suitability for a logistic regression analysis as shown in Table 5.1. The value of 0 should ideally be assigned to the response that indicates a lack of the characteristic of interest (i.e. the absence of annuitisation). For continuous independent variables, high values should indicate more of the characteristic of interest.

Table 5.1: Codes for dependent variables – annuitisation intention: Part 1

Option	Code in Qualtrics	Code in SPSS
Living annuity	1	0 (not annuitising)
Guaranteed annuity	2	1 (annuitising)

Source: Author's conception.

Statistics that assess/evaluate the model's performance include:

i) **Hosmer-Lemeshow Goodness of Fit test**. It is regarded as the most reliable test of model fit (Pallant, 2016: 183). Poor fit is indicated by a significance value less than .05. On the contrary, a value greater than .05 provides support for the usefulness of the model.

ii) **Classification Table output**. This statistic represents the extent to which the independent variables included in the model improve the predictability of a respondent falling in either of the two binary model categories.

iii) **Cox & Snell and Nagelkerke R Squared**. These statistics are known as pseudo R squared statistics that provide an indication of the amount of variation in the dependent variable explained by the model.

5.9.4 Statistical techniques to analyse demographic variables

In Part 2 of this study, the following statistical techniques were employed to analyse potential differences in the mean satisfaction of annuitants categorised in a specific demographic group:

i) **Independent samples t-test**. The independent samples t-test compares the means of two different groups in order to determine whether there is statistical evidence that the respective means are significantly different. If the Levene's test for equality of variances is significant ($p<.05$), the variances in the two groups are significantly different; if it is not, the two variances are approximately equal. For an F-value close to 1, the null hypothesis cannot be rejected. In contrast, a large F-value means that the variation among group means is more than what can be expected by chance (Pallant, 2010: 241-242). The null hypothesis posits no correlation. The independent samples t-test rests on the assumptions that the dependent variable is measured as continuous, or nearly continuous data, and that the independent variable consists of two groups measured as categorical data. This statistical technique also requires that the dependent variable is approximately normally distributed for each group of the independent variable. Homogeneity of variance is also assumed.

ii) **Pearson correlation**. The Pearson correlation coefficient measures the strength and direction of the relationship between the two variables. The Pearson correlation coefficient ranges from -1 to +1. A value of 0 indicates that there is no relationship between the two variables. A value greater than 0 indicates a positive association; that is, as the value of one variable increases, so does the value of the other variable. A value less than 0 indicates a negative association; that is, as the value of one variable increases, the value of the other variable decreases (Pallant, 2010: 122-123). The Pearson correlation rests on the assumption that the two variables are measured as continuous, or nearly continuous data. This statistical technique also requires data that is approximately normally distributed and rests on the assumption that there exists a linear relationship between the two variables.

iii) **The one-way analysis of variance (ANOVA).** The ANOVA is used to determine whether there are any statistically significant differences between the means of more than two different groups. As ANOVA results (the F-values) do not identify which particular differences between pairs of means are significant, a *post-hoc* test such as the Scheffe test is used to explore differences between multiple group means. For an F-value close to 1, the null hypothesis cannot be rejected. In contrast, a large F-value means that the variation among group means is more than what can be expected by chance (Pallant, 2010: 105). ANOVA rests on the assumptions that the dependent variable is measured as continuous, or nearly continuous data and that the independent variables consist of two or more categorical groups. This statistical technique further requires that the dependent variable is approximately normally distributed for each group of the independent variable. Homogeneity of variance is also assumed.

5.10 SCOPE OF THE STUDY

The scope of the study refers to sample size, methodology and scales, as explained below.

5.10.1 Sample size

Although many retirement funds were invited to partake, only current members of two retirement funds participated in Part 1 of the study. Of the two retirement funds that participated in Part 1 of the study, only previous members of one of the retirement funds could also participate in Part 2 of the study, as the other retirement fund did not have any contact with their former members (or retirees). It proved difficult to find respondents to participate in Part 2 of the study, especially given the constraints imposed by The Protection of Personal Information Act 4 of 2013[182] (POPI) (RSA, 2013).

In Part 2 of the study, the factors that associated with the satisfaction levels of annuitants as they relate to the eventual outcome of their annuity decision were investigated. Unfortunately, due to so few retirees choosing a guaranteed annuity as part of their retirement income strategy as is predicted by the annuity puzzle, the sample consisted only of living annuitants.

5.10.2 Methodology

The cross-sectional data collection methodology implemented in this study required different samples for Part 1 and Part 2. The parts in this study run concurrently with distinctive samples that are independent from one another.

5.10.3 Scale development

In Part 1 and Part 2 of the study, questions/scales are grounded in annuity puzzle theory, and also derived from previous questionnaires. Due to a lack of existing empirical evidence on the factors that relate to annuity perception, intention and satisfaction, some items have not been previously scientifically validated.

[182] POPI seeks to promote the protection of personal information processed by public and private entities.

5.11 SUMMARY

Chapter 5 elaborated on the research plan followed in order to conduct the study. The research objectives were presented within the broader context of the research problem and ensuing research questions. The research objectives relate to the identification of annuity decision-making factors, by investigating the factors that relate to annuity perception, intention and satisfaction.

In order to meet the research objectives, the process of establishing the factors that relate to annuity decision-making, was introduced. Next, the population and sample were identified. The method for data collection and the process to develop the research instrument were then explained, followed by the way in which data inconsistencies were dealt with. Subsequently, data processing techniques used to analyse the data were presented. The chapter concluded with scope and limitations.

The next chapter (Chapter 6) offers results with respect to Part 1 of the study, and the following chapter (Chapter 7) offers results with respect to Part 2 of the study.

CHAPTER 6:
RESULTS – PART 1

6.1 INTRODUCTION

Despite the substantial body of scholarly literature that attempts to explain the reticence among retirees to insure themselves against the risk of outliving their capital, there seems to be little empirical evidence to guide our understanding of the factors that relate to annuity income product (AIP) decision-making. In order to reconcile existing annuity theory with retirees' decision-making behaviour, the forces that relate to annuity perceptions, intention and satisfaction levels were investigated in two parts. In Part 1, the factors that related to respondents' annuity perceptions[183] and intention to annuitise were investigated pre-retirement, as they have not yet reached retirement.

In Part 2, the factors that associated with retirees' satisfaction levels as they relate to their AIP choice, were measured. From this point forward, the results for the first part of the study are presented in this chapter. For results of the second part of the study, refer to Chapter 7.

In Part 1, in order to identify the factors that relate to individuals' perceptions regarding a living and a guaranteed annuity, and their subsequent intention to annuitise, a questionnaire grounded in annuity puzzle theory was designed and distributed to two sub-samples. Respondents were categorised according to their intended purchase (living or guaranteed). Annuity characteristics and other factors that relate to living annuity benefit perceptions were measured of the respondents who intended to purchase a living annuity. Correspondingly, annuity characteristics and other factors that relate to guaranteed annuity benefit perceptions were measured of the respondents who intended to purchase a guaranteed annuity.

The results for Part 1 are presented as follows: Section 6.2 discusses survey participation and response rates. Section 6.3 explains the measurement reliability in Part 1. The factors that relate to respondents' benefit perceptions of a living annuity and a guaranteed annuity are discussed in Sections 6.4 and 6.5, respectively; the factors that relate to respondents' intention to annuitise are explained in Section 6.6.1 to Section 6.6.5. The relationship of various demographic factors to respondents' intention to annuitise was also investigated and is described in Section 6.6.6 to Section 6.6.11. Section 6.7 provides evidence for the robustness of the results.

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[183] The empirical investigation into the factors that relate to the benefit perceptions of living and guaranteed annuities is the first such analysis appearing in the literature.

6.2 SURVEY PARTICIPATION AND RESPONSE RATES

The questionnaire was distributed to 2 165 USRF members and 645 Exxaro members. Out of the 213 USRF respondents who completed the survey, 123 respondents (≈58% of the sample) chose a living annuity,[184] and 90 respondents (≈42% of the sample) chose a guaranteed annuity.[185] Out of the 98 Exxaro respondents who completed the survey, 74 respondents (≈75% of the sample) chose a living annuity,[186] and 24 respondents (≈25% of sample) chose a guaranteed annuity.[187] Out of the 311 respondents in total, 197 respondents (≈63%) chose a living annuity and 114 respondents (≈37%) chose a guaranteed annuity. The ratio of total respondents choosing a living annuity over a guaranteed annuity of ≈1.73:1 is expected, as most South Africans favour the living annuity option. The response rates for the two groups were approximately 10 percent (USRF) and 15 percent (Exxaro).

6.3 MEASUREMENT RELIABILITY IN PART 1

Due to the exploratory nature of Part 1 of this study, the internal consistency of factors was evaluated after the data was collected, in order to assess measurement reliability. In Part 1 of this study, Cronbach's alpha[188] (CA) was calculated for each construct/scale. In this study, due to the novelty of Part 1 and the subsequent absence of validated scales[189] a Cronbach's alpha of .5 was deemed acceptable per construct/variable.

Since Cronbach's alpha does not necessarily imply unidimensional (or homogenous)[190] scales, additional exploratory factor analyses (EFA) were performed in SPSS for constructs with multi-dimensional (or heterogeneous)[191] scales.[192] New constructs were developed from the EFA performed. Also, some constructs were split and a few items were deleted as a result of the EFA. See Table 6.1 for a depiction, followed by a discussion of how each variable was formed.

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[184] In order to ensure the integrity of the data, five respondents' answers were removed from the dataset due to inconsistencies (See Section 5.8).

[185] In order to ensure the integrity of the data, one respondent's answers were removed from the dataset due to inconsistencies (See Section 5.8).

[186] In order to ensure the integrity of the data, one respondent's answers were removed from the dataset due to choosing predominantly the same factor on the Likert scale questions throughout and inserting a zero for age.

[187] In order to ensure the integrity of the data, four respondents' answers were removed from the dataset due to inconsistencies (See Section 5.8). One respondent's answers were removed from the dataset due to choosing predominantly the same factor on the Likert scale questions throughout and inserting a five for age.

[188] As developed by Cronbach (1951).

[189] Increasing the number of items in the scale could increase the CAs to more satisfactory levels, as CAs are very sensitive to scales containing fewer than 10 items (Nunnally & Bernstein, 1994: 265; Pallant, 2010: 97).

[190] This occurs when a set of items measures the same construct/scale.

[191] This occurs when items measuring different factors/constructs have high correlations.

[192] As advocated by Cronbach and Shavelson (2004: 413).

Table 6.1: Dependent and independent variables for Part 1

Variables	Items	Cronbach's alpha (CA)	Newly-formed scale (items included; CA)
INVESTOR CONFIDENCE	INV1 INV2	.611	RC MANAGE (INV2 & FLEX1; .769)
FLEXIBILITY	FLEX1 FLEX2 FLEX3 FLEX4	.472	
BEQUEST MOTIVE	BQM1 BQM2 BQM3	.701	N/A
ACCESSIBILITY	ACC1 ACC2	.358	ACCESS_GEN (ACC2)
			ACCESS_RC (ACC1)
MORTALITY RISK	MORT2 MORT3 MORT4 MORT5 MORT6	.629	N/A
TRUST_LIV	TRUST2 TRUST4	.717	N/A
TRUST_GA	TRUST1 TRUST3	.653	N/A
SALIENT_LIV	MSAL2	N/A	N/A
SALIENT_GA	MSAL1	N/A	N/A
PATIENT	PAT1 PAT2	-.163	PATIENCE_GEN (PAT1)
			FIN_SPEED (PAT2)
LITERACY	FINL1 FINL2 FINL3 FINL4	.617	N/A
AWARENESS	CONS1 CONS2 CONS3	.588 (.681 if CONS2 removed)	AWARENESS_AIP (CONS1 & CONS3; .681)
RISK AVERSION	AVER1 AVER2	.457	Inter-item correlation (.298) within acceptable range of between .2 and .4.
INSURANCE	INS	N/A	N/A
FAIRNESS	AAP1 AAP2 AAP3 AAP4	.188	FAIRNESS_NEW (AAP2)

Table 6.1: Dependent and independent variables for Part 1 (continued)

Variables	Items	Cronbach's alpha (CA)	Newly-formed scale (Items included; CA)
CERTAINTY	CERT1 CERT2 CERT3	.799	N/A
DEFAULT RISK	DEF1 DEF2	.222	DEFAULT RISK_SURVIVE (DEF1)
			DEFAULT RISK_DIVERSE (DEF2)
BENEFIT_LIV	POM2 FINS2 ROI2	.810	N/A
BENEFIT_GA	POM1 FINS1 ROI1	.813	N/A

Source: Author's conception.

The first column in Table 6.1 represents the constructs/variables (Part 1). The second column in Table 6.1 contains the items (or questions) that measure each construct/variable. Should the Cronbach's alpha for any specific construct/variable, as shown in the third column in Table 6.1, be above .5, the construct/variable remained unchanged and no further action was required.[193] However, if the Cronbach's alpha for a specific construct/variable is below .5, an EFA was conducted in SPSS which, in some cases, resulted in new constructs. The following sections describe the process followed to finalise each construct/variable in Part 1.

6.3.1 Investor confidence

Investor confidence was measured by the following two questions:

(i) *I could withdraw above-average income from a living annuity each year.*

(ii) *I would probably do better by investing my retirement capital in a living annuity, because my capital would have the potential to grow.*

The Cronbach's alpha for the investor confidence scale was .611, which is above the minimal acceptable level of .5.

After an EFA was performed in SPSS, INV2 and FLEX1 were combined to form a new construct namely RC MANAGE, which refers to the control and flexibility allowed within a living annuity product to generate capital growth. The Cronbach's alpha for the new construct RC Manage scale was .769, which is above the minimal acceptable level of .5. Section 6.3.1 should be considered along with Section 6.3.2, because items from both variables were combined to form a new variable, namely RC MANAGE.

[193] Hence N/A in column four in Table 6.1.

6.3.2 Flexibility

Similarly, flexibility was measured by the following four questions:

(i) *I like the flexibility and control of managing a living annuity.*

(ii) *It would be important to choose the amount of income I receive in retirement each year.*

(iii) *It would be important to choose the financial advisor who manages the underlying investments of my capital in retirement.*

(iv) *It would be important to choose the underlying investments of my capital in retirement myself.*

The Cronbach's alpha for the flexibility scale was .472, which is below the minimal acceptable level of .5.

After an EFA was performed in SPSS, INV2 and FLEX1 were combined to form a new construct namely RC MANAGE, which refers to the control and flexibility allowed within a living annuity product to generate capital growth. The Cronbach's alpha for the new construct RC Manage scale was .769, which is above the minimal acceptable level of .5. Section 6.3.2 should be considered along with Section 6.3.1, because items from both variables were combined to form a new variable, namely RC MANAGE.

6.3.3 Bequest motive

The bequest motive was measured by the following three questions:

(i) *At death, it is important to me to leave my remaining retirement capital to my heirs.*

(ii) *My family would fund any shortfall I might have in retirement, in return for inheriting any money left in my living annuity.*

(iii) *It is important to me to leave an inheritance to my heirs at death.*

The Cronbach's alpha for the bequest motive scale was .701, which is above the minimal acceptable level of .5.

6.3.4 Accessibility

Accessibility was measured by the following two questions:

(i) *A living annuity is desirable as it allows me access to my retirement capital to pay for unforeseen expenses – for example, medical costs or home repairs.*

(ii) *It is important to have access to cash during retirement for emergencies.*

The Cronbach's alpha for the accessibility scale was .358, which is below the minimal acceptable level of .5. After an EFA was performed in SPSS, these were included as single items, as follows: (i) accessibility to capital in general; and (ii) accessibility to retirement capital specifically.

6.3.5 Mortality risk

Mortality risk was measured by the following five questions:

(i) I fear outliving my retirement capital.

(ii) It is likely that I survive to age 75.

(iii) It is likely that I survive to age 85.

(iv) It is likely that I survive to age 90 and beyond.

(v) I am uncertain about my own biological survival prospects at retirement.

The Cronbach's alpha for the mortality risk scale was .629, which is above the minimal acceptable level of .5.

6.3.6 Trust in advisor selling living annuities

Trust in financial advisor was measured by the following two questions:

(i) Financial advisors selling living annuities pursue only their own self-interested goals.[194]

(ii) I believe that financial advisors selling living annuities have their clients' best interests at heart.

The Cronbach's alpha for the trust scale was .717, which is above the minimal acceptable level of .5.

6.3.7 Trust in advisor selling guaranteed annuities

Trust in financial advisor was measured by the following two questions:

(i) Financial advisors selling guaranteed annuities pursue only their own self-interested goals.[195]

(ii) I believe that financial advisors selling guaranteed annuities have their clients' best interests at heart.

The Cronbach's alpha for the trust scale was .653, which is above the minimal acceptable level of .5.

6.3.8 Mortality salience_LIV

Mortality salience with respect to a living annuity was measured by the following item:

(i) A living annuity makes me think about my own death.

No further action was required.

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[194] The data generated by this question was reverse-coded before analysis.

[195] The data generated by this question was reverse-coded before analysis.

6.3.9 Mortality salience_GA

Mortality salience with respect to a guaranteed annuity was measured by the following item:

(ii) A guaranteed annuity makes me think about my own death.

No further action was required.

6.3.10 Patience

Patience was measured by the following two questions:

(i) I regard myself as someone who is patient.
(ii) I make financial planning decisions quickly.

The Cronbach's alpha for the patience scale was -.163, which is well below the minimal acceptable level of .5, which is an indication that the items did not measure the same construct. After an EFA was performed in SPSS, these were included as single items, as follows: (i) general patience; and (ii) speed of financial decision-making.

6.3.11 Literacy

Literacy was measured by the following four questions:

(i) Investing in retirement funds has the same tax advantages as other investment funds.
(ii) All retirement funds guarantee to pay retirees a pension until their death.
(iii) It makes sense to invest money in the shares of more than one company.
(iv) Pension fund law prohibits retirement funds to invest in shares.

The Cronbach's alpha for the literacy scale was .617, which is above the minimal acceptable level of .5.

6.3.12 Awareness

Awareness was measured by the following three questions:

(i) I am familiar with retirement income options.
(ii) I educate myself on retirement income options.
(iii) I have consulted with a financial advisor about retirement income options.

The Cronbach's alpha for the awareness scale was .588, which already is above the acceptable level of .5. Based on the Cronbach's alpha results as produced by SPSS, item CONS2 was removed. The Cronbach's alpha for the new construct AIP awareness scale increased to .681, which is above the minimal acceptable level of .5 (See Table 6.1).

6.3.13 Risk aversion

Risk aversion was measured by the following two questions:

(i) *I prefer investments that offer high returns, even if it is a risky decision.*

(ii) *I try to avoid financial risk.*[196]

The Cronbach's alpha for the risk aversion scale was .457, which is below the minimal acceptable level of .5. As the inter-item total correlation was within the acceptable range of between .2 and .4, the researcher decided to keep this scale unchanged.

6.3.14 Insurance

Insurance was measured by the following item:

(i) *I intend to keep the death benefits provided by my employer's group life scheme in place after retirement.*

No further action was required.

6.3.15 Fairness

Fairness was measured by the following four questions:

(i) *I could withdraw sufficient income from a guaranteed annuity each year.*

(ii) *It is unfair that insurance companies offering guaranteed annuities keep the excess funds at the annuitant's death.*

(iii) *It makes sense to exchange my retirement capital for a guaranteed income stream for life.*

(iv) *Insurance companies rip people off.*

The Cronbach's alpha for the fairness scale was .188, which is well below the minimal acceptable level of .5, which is an indication that the items did not measure the same construct. After an EFA was performed in SPSS, the researcher decided to retain one item to measure fairness, i.e. AAP2 as is referred to by the second question above.

6.3.16 Certainty

Certainty was measured by the following three questions:

(i) *I prefer to know exactly what my future income stream will be.*

(ii) *I prefer a guaranteed annuity that runs automatically and that requires no further decision-making from me.*

(iii) *I prefer a guaranteed income stream for life.*

The Cronbach's alpha for the certainty scale was .799, which is above the acceptable level of .5.

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[196] The data generated by this question was reverse-coded before analysis.

6.3.17 Default risk

Default risk was measured by the following two questions:

(i) *I feel confident that insurance companies offering guaranteed annuities will survive over the long term.*

(ii) *Purchasing a guaranteed annuity from only one insurance company is risky, as that company could become insolvent.*

The Cronbach's alpha for the default risk scale was .222, which is well below the minimal acceptable level of .5, which is an indication that the items did not measure the same construct. After an EFA was performed in SPSS, the following were included as single items: (i) default (survival); and (ii) default (diverse).

6.3.18 Benefit perception_LIV

The benefit perceptions of living annuities were measured by the following three questions:

(i) *A living annuity will give me peace of mind.*

(ii) *A living annuity will ensure me a fair return on my investment.*

(iii) *A living annuity will give me financial security.*

The Cronbach's alpha for the benefit perceptions of living annuities scale was .810, which is above the acceptable level of .5.

6.3.19 Benefit perception_GA

The benefit perceptions of guaranteed annuities were measured by the following three questions:

(i) *A guaranteed annuity will give me peace of mind.*

(ii) *A guaranteed annuity will ensure me a fair return on my investment.*

(iii) *A guaranteed annuity will give me financial security.*

The Cronbach's alpha for the benefit perceptions of guaranteed annuities scale was .812, which is above the acceptable level of .5.

6.4 BENEFIT PERCEPTIONS OF LIVING ANNUITIES – PART 1(A)

For Part 1 of the study, the factors that relate to the benefit perceptions of living annuities were identified. The dependent and independent variables represent the theoretical framework on which this empirical analysis is based, with the purpose of ascertaining which factors relate to the perceptions about living annuities.

The dependent variable represents the benefit perceptions of living annuities (as is discussed in the current section) and were measured by peace of mind, financial security, and return on investment. The three items were averaged to form the benefit perceptions of living annuities construct in the regression analysis. The three items were chosen by the researcher to represent the benefit perceptions of living annuities. The independent variables are listed in Table 6.2 and consist of the items shown in Table E.1 (See Appendix E). All independent variables were measured as ordinal, or nearly continuous data, linked to a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree). Descriptive statistics for all factors are given in Table F.1 (Appendix F).

A multiple linear regression was performed in SPSS in order to ascertain which factors relate to respondents' benefit perceptions of a living annuity (Option 1). As there are 13 independent variables, a minimum sample size of about 128 respondents was required (Stevens, 1996: 72).[197]

6.4.1 Factors that related to the benefit perceptions of living annuities

A multiple regression was performed in SPSS in order to ascertain which independent variables or factors related to the benefit perceptions of living annuities. According to the multiple regression results, the R squared, which refers to the amount of variation in the dependent variable (benefit perceptions) explained by the independent variables amounts to 46.1 percent. The standard error of the estimate is within the acceptable range of +2 and -2 (SE = .81391).[198] The F-statistic is 12.022 ($p < .001$), which indicates that the proposed model has a good fit. The multiple regression results are summarised in Table 6.2.

[197] The required sample size is calculated as 50 + (6 x 13).

[198] The smaller the SE, the more accurate the Beta-coefficients.

Table 6.2: Factors that related to the benefit perceptions of living annuities

Independent variable	Beta-coefficient (B)	t-statistic	Collinearity statistics	
			Tolerance	VIF
RC MANAGE	.387	6.138***	.743	1.345
ACCESS_RC	.258	4.100***	.747	1.339
TRUST IN ADVISOR	.195	3.419**	.904	1.107
AWARENESS_NEW	.151	2.506*	.814	1.228
BEQUEST MOTIVE	.150	2.485*	.807	1.240
ACCESS_GEN	-.065	-1.051	.776	1.289
MORTALITY RISK (low)	.030	.526	.929	1.077
MORTALITY SALIENCE	-.060	-1.043	.896	1.116
PATIENCE_GEN	.017	.290	.882	1.133
FIN_SPEED	.071	1.212	.868	1.153
LITERACY	-.117	-1.886	.771	1.297
RISK AVERSION (low)	-.053	-.883	.822	1.217
INSURANCE	.006	.094	.749	1.336

*p<.05 **p<.01 ***p<.001

Source: Author's conception.

No multiple regression analysis assumptions were violated in a way that would invalidate results. Specifically, the data was tested for non-linearity between each independent variable and dependent variable. The possibility of multi-collinearity among independent variables was also investigated using the tolerance and VIF collinearity statistics produced by SPSS. As shown in Table 6.2, tolerance values are not less than .10 and VIF values are not above 10. Therefore, inferences made about the relationships of the independent variables to the dependent variable, as measured by the Beta-coefficients, can be interpreted with confidence.

6.4.2 Hypothesis testing for the benefit perceptions of living annuities

The following hypotheses[199] were tested in order to assess the relationship between the benefit perceptions of living annuities (dependent variable) and the independent variables as shown in Table 6.3.

[199] In all cases the null hypothesis was addressed.

Table 6.3: Hypotheses for the benefit perceptions of living annuities

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
1.	RC MANAGE	Directional (positive)	H0[1]: There is no relationship between managing retirement capital and the benefit perceptions of a living annuity. **Ha[1]: There is a relationship between managing retirement capital and the benefit perceptions of a living annuity.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, the control and flexibility to earn an above-average income from a living annuity due to the growth generated by the underlying investment portfolio, contribute positively to the benefit perceptions of a living annuity.
2.	ACCESS_RC	Directional (positive)	H0[2] There is no relationship between access to retirement capital and the benefit perceptions of a living annuity. **Ha[2]: There is a relationship between access to retirement capital and the benefit perceptions of a living annuity.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, accessibility to living annuity capital contributes positively to the benefit perceptions of a living annuity.
3.	TRUST IN ADVISOR (LIV)	Directional (positive)	H0[3]: There is no relationship between trusting financial advisors selling living annuities and the benefit perceptions of a living annuity. **Ha[3]: There is a relationship between trusting financial advisors selling living annuities and the benefit perceptions of a living annuity.**	The p-value is significant at the 1% confidence level (p = .001). The null hypothesis must therefore be rejected. Deductively, trusting financial advisors selling living annuities contributes positively to the benefit perceptions of a living annuity.
4.	AWARENESS	Directional (positive)	H0[4]: There is no relationship between annuity income product awareness and the benefit perceptions of a living annuity. **Ha[4]: There is a relationship between annuity income product awareness and the benefit perceptions of a living annuity.**	The p-value is significant at the 5% confidence level (p = .013). The null hypothesis must therefore be rejected. Deductively, awareness of AIPs contributes positively to the benefit perceptions of a living annuity.
5.	BEQUEST MOTIVE	Directional (positive)	H0[5]: There is no relationship between the bequest motive and the benefit perceptions of a living annuity. **Ha[5]: There is a relationship between the bequest motive and the benefit perceptions of a living annuity.**	The p-value is significant at the 5% confidence level (p = .014). The null hypothesis must therefore be rejected. Deductively, the bequest motive contributes positively to the benefit perceptions of a living annuity.

Table 6.3: Hypotheses for the benefit perceptions of living annuities (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
6.	ACCESS_GEN	Null	**$H0^6$: There is no relationship between accessibility to capital in general and the benefit perceptions of a living annuity.** Ha^6: There is a relationship between accessibility to capital in general and the benefit perceptions of a living annuity.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.
7.	MORTALITY RISK	Null	**$H0^7$: There is no relationship between mortality risk and the benefit perceptions of a living annuity.** Ha^7: There is a relationship between mortality risk and the benefit perceptions of a living annuity.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.
8.	MORTALITY SALIENCE	Null	**$H0^8$: There is no relationship between mortality salience and the benefit perceptions of a living annuity.** Ha^8: There is a relationship between mortality salience and the benefit perceptions of a living annuity.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.
9.	PATIENCE_GEN	Null	**$H0^9$: There is no relationship between general patience and the benefit perceptions of a living annuity.** Ha^9: There is a relationship between general patience and the benefit perceptions of a living annuity.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.
10.	FIN_SPEED	Null	**$H0^{10}$: There is no relationship between speed of financial decision-making and the benefit perceptions of a living annuity.** Ha^{10}: There is a relationship between speed of financial decision-making and the benefit perceptions of a living annuity.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.
11.	LITERACY	Null	**$H0^{11}$: There is no relationship between financial literacy and the benefit perceptions of a living annuity.** Ha^{11}: There is a relationship between financial literacy and the benefit perceptions of a living annuity.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.

Table 6.3: Hypotheses for the benefit perceptions of living annuities (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
12.	RISK AVERSION	Null	**$H0^{12}$: There is no relationship between risk aversion and the benefit perceptions of a living annuity.** Ha^{12}: There is a relationship between risk aversion and the benefit perceptions of a living annuity.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.
13.	INSURANCE	Null	**$H0^{13}$: There is no relationship between insurance and the benefit perceptions of a living annuity.** Ha^{13}: There is a relationship between insurance and the benefit perceptions of a living annuity.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.

Source: Author's conception.

From the 13 hypotheses, five factors (or independent variables) proved to be statistically significant. The five factors that relate to the benefit perceptions of living annuities are discussed further in Section 6.4.3.

6.4.3 Factors that relate to living annuity benefit perceptions

As seen in Table 6.3, the following factors (or independent variables) significantly relate to respondents' benefit perceptions of a living annuity: (i) Managing retirement capital; (ii) access to retirement capital; (iii) trust in advisors selling living annuities; (iv) AIP awareness; and the (v) bequest motive. These factors are discussed in detail below.

6.4.3.1 Managing retirement capital

Managing retirement capital (RC Manage) exerts the strongest relationship (B = .387) to respondents' benefit perceptions of a living annuity. There is a significant positive relationship (p<.001) between managing retirement capital and the benefit perceptions of a living annuity. For that reason, the control and flexibility to earn an above-average income from a living annuity due to the expected growth generated by the underlying investment portfolio, contribute positively to the benefit perceptions of a living annuity.

RC Manage was measured by asking respondents two questions. The first question asked respondents whether they thought they could do better by investing their retirement capital in a living annuity in order to generate capital growth. The second question asked respondents in broad terms whether they liked the flexibility and control of managing a living annuity.

Respondents who think they can withdraw an above-average income, as well as generate capital growth from the underlying investments in a living annuity,[200] have confidence in their own investment skills and/or the investment skills of financial advisors. They are thus more likely to view self-annuitisation as beneficial.

Also, many retirees may prefer to take on investment risk when they retire, as they expect to live for another 20 years or more. Over these time horizons, they might feel that some higher-risk investment may be appropriate.

This line of thought was echoed by Gardner and Wadsworth (2004), who suggested that the respondents in their study believed that they could earn a higher income (compared to the income stream provided by a guaranteed annuity) by investing retirement capital themselves. The significance of investor confidence as it relates to the appeal of a living annuity was also confirmed by Goedde-Menke et al. (2014), who suggested that retirees may feel more competent than insurers in managing retirement capital.

In similar vein, in a South African context, Rusconi (2006) and National Treasury (2012) provided anecdotal evidence suggesting that investor confidence positively influences people's perceptions of a living annuity.

RC Manage relating to an individual's perception that living annuities are favourable could be due to annuitants viewing living annuities through the investment frame. Both questions that were used to measure investor confidence in this study were formulated using the investment frame. The first question was formulated using the investment frame in an indirect way, as superior investment returns on living annuity capital translate into above-average income. The second question used the investment frame directly by focusing on the potential to earn capital growth on the investments underlying the living annuity product. The questions were therefore not formulated using the consumption frame, which focuses on the inability of living annuities to guarantee consumption for life. This study suggests that the formulation of living annuity characteristics through the investment frame positively related to its benefit perceptions.

Evidence of the role of the framing effect is supported in the literature. Brown et al. (2008) found that, instead of viewing the decision to annuitise through the consumption frame (focusing on what can be spent over time), many retirees adopt an investment frame (focusing on the return and risk features when choosing AIPs, without considering the consequences for consumption). Individuals therefore essentially isolate one choice (how to invest) from another (how to consume) and focus on specific features of that choice, rather than viewing it as part of a whole. The attractive feature of self-annuitising under the investment frame is the possibility of generating superior investment returns (whereas the unattractive feature of self-annuitisation under the consumption frame is the

[200] Especially given the past high share market returns as experienced by South Africans in the two decades until 2016.

possibility of outliving retirement capital). The unattractive feature of annuitisation in the investment frame will be the potential to receive poor value for money in the event of premature death. (However, under the consumption frame, annuitisation is attractive, as it serves as a form of insurance for consumption throughout retirement.)

In addition, the results of flexibility as a significant contributor to the benefit perceptions of living annuities seem to be on par with international research. Gardner and Wadsworth (2004) suggested that the desire for flexibility is a key factor influencing the desirability of living annuities. In addition, Rusconi (2006) found that many individuals fully retire much later in life than previously. Therefore, the transition from full-time work to no work at all often happens gradually, in which case income flexibility is important.

6.4.3.2 Access to retirement capital

Accessibility to retirement capital exerts the second strongest relationship (B = .258) to respondents' benefit perceptions of a living annuity. There is a significant positive relationship ($p<.001$) between accessibility and the benefit perceptions of a living annuity. Thus, accessibility to capital within a living annuity contributes positively to the benefit perceptions of a living annuity.

Accessibility to retirement capital was measured by asking respondents one question. The question asked respondents whether they preferred a living annuity as it provided access to retirement capital to pay for unforeseen expenses. This question has a narrow focus, by referring specifically to retirement capital, and not retirement assets in general. It could be important to a retiree to have access to his/her retirement capital in order to pay for unforeseen future expenses, the amount and timing of which are difficult to establish in advance. Having a safety net for emergency expenses could be important to a retiree. A living annuity is the only AIP that allows the annuitant access to retirement capital (within the annual limits).

The finding that accessibility is a significant contributing factor to annuity decision-making is consistent with results reported in international literature. The following authors reported similar findings: Sinclair and Smetters (2004); Ameriks et al. (2011); and Peijnenburg et al. (2017).

6.4.3.3 Trust in financial advisors selling living annuities

Trust in financial advisors selling living annuities exerts the third strongest relationship (B = .195) to respondents' benefit perceptions of a living annuity. There is a positive relationship ($p<.01$) between trusting financial advisors selling living annuities and the benefit perceptions of a living annuity. Thus, trusting financial advisors selling living annuities contributes positively to the benefit perceptions of a living annuity.

Trust was measured by asking respondents two questions. In order to measure trust in financial advisors selling living annuities, the first question asked respondents whether they think financial advisors selling living annuities pursue only their own self-interested goals.[201] The second question asked respondents whether they believe financial advisors selling living annuities have their clients' best interests at heart. In order to establish trust, it is important for clients to believe that their financial advisor will act in good faith.

Financial advisors selling guaranteed annuities earn a once-off commission only. Conversely, financial advisors selling living annuities earn an ongoing fee, as a percentage of the underlying investment amount. National Treasury (2012) highlighted the sales incentives among financial advisors to promote living annuities, since the present value of fees earned by financial advisors selling living annuities may be up to ten (10) times higher than what is earned on the guaranteed policy equivalent. High living annuity fees could substantially shrink the underlying value of the living annuity over the annuitant's life.

There are no known studies in the literature that investigated the role of trust in financial advisors selling living annuities as a factor related to the favourable outlook on AIPs. This result raises the question whether people are aware of the discrepancy in income earned by financial advisors selling living versus guaranteed annuities.

6.4.3.4 Annuity income product awareness

AIP awareness exerts the fourth strongest relationship (B = .151) to respondents' benefit perceptions of a living annuity. A significant positive relationship ($p<.05$) exists between awareness and the benefit perceptions of a living annuity. In other words, consumer awareness and education about AIPs contribute positively to the benefit perceptions of a living annuity.

Product awareness of retirement income options was measured by asking respondents two questions. The first question asked respondents if they were familiar with retirement income options, and did not specifically refer to either a living and/or guaranteed annuity product. The second question established whether respondents had educated themselves on retirement income options in general. No mention is made of specific AIPs in this case either.

Awareness captures a respondent's understanding and clarity of the main characteristics of retirement income options available. Individuals who are familiar with retirement income options and actively educate themselves, may be in a better position to weigh the benefits and disadvantages of annuitisation versus self-annuitisation.

There are no known studies in the literature that investigated the role of awareness of AIPs as a factor related to the favourable outlook on living annuities.

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[201] The data generated by this question was reverse-coded before analysis.

6.4.3.5 Bequest motive

The bequest motive exerts the fifth strongest relationship (B = .150) to respondents' benefit perceptions of a living annuity. There is a significant positive relationship ($p<.05$) between the bequest motive and the benefit perceptions of a living annuity. In other words, the bequest motive contributes positively to the benefit perceptions of a living annuity.

The bequest motive was measured by asking respondents three questions. The first question asked respondents whether it is important to leave remaining capital to heirs. This question therefore has a narrow focus, by referring specifically to retirement capital, and not assets in general. It could be important to an individual to leave his/her remaining retirement capital to heirs at death for altruistic reasons. Similarly, it could be important to keep his/her retirement capital intact for egotistical reasons. Having the desire to keep retirement capital intact in anticipation of death or finding it hard to part with retirement capital in anticipation of death could be explained by the endowment effect.[202]

The second question refers indirectly to the bequest motive. Potential heirs might be willing to fund the retiree should he/she run out of capital during his/her lifetime, in exchange for inheriting any money left in the annuitant's living annuity. Such a strategy refers to risk-sharing within families. Although this question focuses on the potential heir's bequest motive, the question is asked from the respondent's or prospective annuitant's perspective. In practice, all parties (i.e. the retiree and the family member or members) would have to agree to such a strategy, either on a formal or an informal basis. The third question has a broader focus and measures the importance to respondents of leaving an inheritance to heirs in general. This question has an altruistic undertone as specific reference is made to heirs.

The bequest motive as a contributing factor to the desirability of living annuities is supported in the international literature. The following authors concur, although to varying degrees: Friedman and Warshawsky (1988; 1990); Bernheim (1991); Laitner and Juster (1996); Wilhelm (1996); Gardner and Wadsworth (2004); Vidal-Meliá and Lejárraga-García (2006); Kopczuk and Lupton (2007); Purcal and Piggott (2008); Lockwood (2012); Pashchenko (2010); Ameriks et al. (2011); and Inkmann et al. (2011).

Although Hurd (1987), Brown (2001) and Cappelletti et al. (2013) found no evidence for the existence of a bequest motive, the proxy they used to test for a bequest motive, namely the presence of children, proved questionable, based on the argument that childless people could desire to leave bequests to heirs that are not their children.

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[202] The endowment effect, which stems from prospect theory's loss aversion (Tversky & Kahneman, 1981) refers to the overvaluation of current possessions (Thaler, 1980).

The benefits of risk-sharing among family members are well acknowledged in the international literature. The following authors concur: Schmeiser and Post (2005) as well as Post et al. (2006). Hayashi et al. (1996), however found no empirical evidence of general risk-sharing between and within families. The phenomenon of risk-sharing between husband and wife is well documented in the literature, by several authors: Kotlikoff and Spivak (1981); Brown and Poterba (2000); Brown (2001); Hurd and Panis (2006); Bütler and Teppa (2007); and Inkmann et al. (2011).[203] However, Cappelletti et al. (2013) found no empirical evidence of risk-sharing between husband and wife.

Finally, according to anecdotal evidence by Rusconi (2006) and National Treasury (2012), it appears as if private mortality pooling between spouses and families or other informal support networks could drive South Africans' favourable perceptions regarding living annuities.

6.4.4 Statistically non-significant variables

The multiple regression analysis also shows which factors (or independent variables) are not significant to respondents' attitude towards living annuities. The following factors do not significantly contribute to the benefit perceptions of living annuities: (i) general accessibility; (ii) mortality risk; (iii) mortality salience; (iv) general patience; (v) speed of financial decision-making; (vi) literacy; (vii) risk aversion; (viii) insurance. The investigation into the possible relationships between these factors (or independent variables) as they relate specifically to the benefit perceptions of living annuities, is the first such analysis appearing in the literature, to the researcher's knowledge.

6.4.5 Test for robustness

If results are robust, they will hold and deliver similar results under a variety of conditions, even if the assumptions are altered or violated. To test for robustness, the analysis was repeated by including all independent variables and demographic variables into one multiple regression. The addition of the demographic variables did not change the main findings, conclusions and implications of the study.

6.4.6 Summary

In this analysis the factors that relates to the benefit perceptions of living annuities were identified. It is evident from the multiple regression analysis, that the factor (or independent variable) that relates to respondents' benefit perceptions of living annuities the most, is their belief that the product will earn them a superior income stream of payments as afforded by the control and flexibility over managing retirement capital. In addition, having access to retirement capital to pay for unforeseen expenses, adds to respondents' positive outlook on living annuities. Moreover, the presence of trust in the financial advisor/client relationship contributes significantly to respondents' positive attitude

[203] In further support of risk-sharing between husband and wife, 81.7% of the respondents who chose a living annuity were married, compared with 72.8% of the respondents who chose a guaranteed annuity .

towards living annuities. Furthermore, AIP awareness prove to be significantly important to respondents viewing the living annuity option as favourable. Finally, respondents' desire to leave a bequest to heirs, which includes their remaining living annuity capital, plays a significant role in their benefit perceptions of living annuities. In the next section, the factors (or independent variables) that relate to the benefit perceptions of guaranteed annuities, are presented.

6.5 BENEFIT PERCEPTIONS OF GUARANTEED ANNUITIES – PART 1(B)

For Part 1 of the study, the factors that relate to the benefit perceptions of guaranteed annuities were identified. The dependent and independent variables represent the theoretical framework on which this empirical analysis is based, with the purpose of ascertaining which factors relate to the benefit perceptions about guaranteed annuities.

The dependent variable refers to the benefit perceptions of guaranteed annuities (as is discussed in the current section) and were measured by peace of mind, financial security, and return on investment. The three items were averaged to form the benefit perceptions of guaranteed annuities construct in the regression analysis. The three items were chosen by the researcher to represent the benefit perceptions of guaranteed annuities.

The independent variables are listed in Table 6.4 and consist of the items shown in Table E.2 (See Appendix E). All independent variables were measured as ordinal, or nearly continuous data, linked to a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree). Descriptive statistics for all factors are given in Table F.2 (Appendix F).

A multiple linear regression was performed in SPSS in order to ascertain which factors relate to respondents' benefit perceptions of a guaranteed annuity (Option 2). As there are 13 independent variables, a minimum sample size of about 128 respondents was required (Stevens, 1996: 72).[204]

6.5.1 Factors that related to the benefit perceptions of guaranteed annuities

According to the multiple regression results, the R squared, which refers to the amount of variation in the dependent variable explained by the independent variables, amounts to 53.4 percent. The standard error of the estimate is within the acceptable range of +2 and -2 (SE = .67097). The F-statistic is 8.826 ($p<.001$), which indicates that the proposed model has a good fit.

The regression results are summarised in Table 6.4.

[204] The required sample size is calculated as 50 + (6 x 13).

Table 6.4: Factors that related to the benefit perceptions of guaranteed annuities

Independent variable	Beta-coefficient (B)	t-statistic	Collinearity statistics	
			Tolerance	VIF
AWARENESS_NEW	.304	3.834***	.741	1.349
CERTAINTY	.283	3.650***	.776	1.288
MORTALITY RISK (low)	.192	2.528*	.811	1.233
RISK AVERSION (low)	-.181	-2.344*	.778	1.285
DEFAULT RISK_SURVIVE (low)	.148	1.972	.829	1.206
DEFAULT RISK_DIVERSE (low)	-.151	-1.983	.801	1.248
INSURANCE	.160	1.889	.652	1.533
MORTALITY SALIENCE	.072	.908	.730	1.369
PATIENCE_GEN	-.007	-.100	.880	1.136
FIN_SPEED	-.017	-.227	.871	1.148
LITERACY	-.083	-1.063	.770	1.299
TRUST IN ADVISOR	.121	1.552	.773	1.294
FAIRNESS	-.077	-.963	.736	1.358

*p<.05 **p<.01 ***p<.001

Source: Author's conception.

No multiple regression analysis assumptions were violated in a way that would invalidate results. Specifically, the data was tested for non-linearity between each independent variable and dependent variable. Although some variables indicated non-linearity, further analysis confirmed that the reported results were not influenced by such non-linear relationships. The possibility of multi-collinearity among independent variables was also investigated using the tolerance and VIF collinearity statistics produced by SPSS. As shown in Table 6.4, tolerance values are not less than .10 and VIF values are not above 10. Therefore, inferences made about the relationships of the independent variables to the dependent variable, as measured by the Beta-coefficients, can be interpreted with confidence.

6.5.2 Hypotheses for the benefit perceptions of guaranteed annuities

The following hypotheses[205] were tested in order to assess the relationship between the independent variables and the benefit perceptions of guaranteed annuities (dependent variable) as shown in Table 6.5.

[205] In all cases the null hypothesis was addressed.

Table 6.5: Hypotheses for the benefit perceptions of guaranteed annuities

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & alternative hypothesis (Ha)	Interpretation
1.	AWARENESS	Directional (positive)	$H0^1$: There is no relationship between annuity income product awareness and the benefit perceptions of a guaranteed annuity. **Ha^1: There is a relationship between annuity income product awareness and the benefit perceptions of a guaranteed annuity.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, consumer awareness and education about AIPs contribute positively to the benefit perceptions of a guaranteed annuity.
2.	CERTAINTY	Directional (positive)	$H0^2$: There is no relationship between certainty and the benefit perceptions of a guaranteed annuity. **Ha^2: There is a relationship between certainty and the benefit perceptions of a guaranteed annuity.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, the certainty provided by a guaranteed annuity in the form of income guarantees contributes positively to the benefit perceptions of a guaranteed annuity.
3.	MORTALITY RISK (low)	Directional (positive)	$H0^3$: There is no relationship between mortality risk and the benefit perceptions of a guaranteed annuity. **Ha^3: There is a relationship between mortality risk and the benefit perceptions of a guaranteed annuity.**	The p-value is significant at the 5% confidence level (p = .013). The null hypothesis must therefore be rejected. Deductively, low risk of dying contributes positively to the benefit perceptions of a guaranteed annuity.
4.	RISK AVERSION (low)	Directional (negative)	$H0^4$: There is no relationship between low risk aversion and the benefit perceptions of a guaranteed annuity. **Ha^4: There is a relationship between low risk aversion and the benefit perceptions of a guaranteed annuity.**	The p-value is significant at the 5% confidence level (p = .021). The null hypothesis must therefore be rejected. Deductively, low risk aversion (or being risk seeking) contributes negatively to the benefit perceptions of a guaranteed annuity.
5.	DEFAULT RISK_SURVIVE	Null	**$H0^5$: There is no relationship between default risk (survival of insurance companies) and the benefit perceptions of a guaranteed annuity.** Ha^5: There is a relationship between default risk of insurance companies and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.

Table 6.5: Hypotheses for the benefit perceptions of guaranteed annuities (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & alternative hypothesis (Ha)	Interpretation
6.	DEFAULT RISK_DIVERSE	Null	**$H0^6$: There is no relationship between default risk (insolvency) and the benefit perceptions of a guaranteed annuity.** Ha^6: There is a relationship between default risk and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
7.	INSURANCE	Null	**$H0^7$: There is no relationship between insurance and the benefit perceptions of a guaranteed annuity.** Ha^7: There is a relationship between insurance and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
8.	MORTALITY SALIENCE	Null	**$H0^8$: There is no relationship between mortality salience and the benefit perceptions of a guaranteed annuity.** Ha^8: There is a relationship between mortality salience and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
9.	PATIENCE_GEN	Null	**$H0^9$: There is no relationship between general patience and the benefit perceptions of a guaranteed annuity.** Ha^9: There is a relationship between general patience and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
10.	FIN_SPEED	Null	**$H0^{10}$: There is no relationship between the speed of financial decision-making and the benefit perceptions of a guaranteed annuity.** Ha^{10}: There is a relationship between the speed of financial decision-making and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.

Table 6.5: Hypotheses for the benefit perceptions of guaranteed annuities (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & alternative hypothesis (Ha)	Interpretation
11.	LITERACY	Null	**$H0^{11}$: There is no relationship between financial literacy and the benefit perceptions of a guaranteed annuity.** Ha^{11}: There is a relationship between financial literacy and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
12.	TRUST IN ADVISOR	Null	**$H0^{12}$: There is no relationship between trusting financial advisors selling guaranteed annuities and the benefit perceptions of a guaranteed annuity.** Ha^{12}: There is a relationship between trusting financial advisors selling guaranteed annuities and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
13.	FAIRNESS	Null	**$H0^{13}$: There is no relationship between fairness and the benefit perceptions of a guaranteed annuity.** Ha^{13}: There is a relationship between fairness and the benefit perceptions of a guaranteed annuity.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.

Source: Author's conception.

From the 13 hypotheses, four factors proved to be statistically significant. The four factors that relate to the benefit perceptions of guaranteed annuities are discussed further in Section 6.5.3.

6.5.3 Factors that relate to guaranteed annuity benefit perceptions

As seen in Table 6.5, the following factors (or independent variables) significantly related to respondents' benefit perceptions of a guaranteed annuity: (i) AIP awareness; (ii) certainty; (iii) mortality risk (low); and (iv) risk aversion (low). These factors are discussed in detail below.

6.5.3.1 Annuity income product awareness

Product awareness, as it relates to retirement income options, exerted the strongest relationship ($B = .304$) to respondents' benefit perceptions of a guaranteed annuity. A significant positive relationship ($p<.001$) exists between awareness and the benefit perceptions of a guaranteed annuity.

In other words, consumer awareness and education about AIPs contribute positively to the benefit perceptions of a guaranteed annuity.

Product awareness of retirement income options was measured by asking respondents two questions. The first question asked respondents if they are familiar with retirement income options, and does not specifically refer to either a living and/or guaranteed annuity product. The second question established whether respondents have educated themselves on retirement income options in general. No mention was made of specific AIPs in this case either.

Awareness captures a respondent's understanding and clarity of the main characteristics of retirement income options available. Individuals who are familiar with retirement income options and actively educate themselves, are more likely to choose an annuity that will protect them against longevity and investment risks in retirement. In this way, being aware of and educated in AIPs, could place a person in a better position to weigh the benefits and disadvantages of annuitisation versus self-annuitisation.

Several local and international authors have suggested that consumer awareness and education regarding retirement income options positively influence a favourable outlook on guaranteed annuities, e.g. Rusconi (2006); Ganegoda and Bateman (2008); as well as Bateman et al. (2013).

6.5.3.2 Certainty

Certainty exerted the second strongest relationship (B = .283) to respondents' benefit perceptions of a guaranteed annuity. There is a significant positive relationship ($p<.001$) between certainty and the benefit perceptions of a guaranteed annuity (See Table 6.5). Thus, the certainty provided by a guaranteed annuity, in the form of income guarantees, contributes positively to the benefit perceptions of a guaranteed annuity.

Certainty was measured by asking respondents three questions. The first question to measure certainty did not directly refer to a guaranteed annuity, but asked respondents whether they preferred to know exactly what their income stream would be in the future. The second question referred directly to a guaranteed annuity and asked respondents whether they preferred an income stream that ran automatically without any involvement from them. The third question did not refer directly to a guaranteed annuity and asked respondents whether they preferred an income stream that was guaranteed for the rest of their lives. These questions explored whether the certainty of annuity income payments that were guaranteed for life, positively related to their benefit perceptions of a guaranteed annuity.

This study shows that a pre-determined income, as opposed to a flexible income stream that is often dependent on volatile and unpredictable investment returns, as well a product that runs by itself without continuous decision-making, positively contribute to the benefit perceptions of a guaranteed annuity. Respondents choosing a guaranteed annuity, probably appreciate the complete protection

against longevity and investment risk that the product provides, by knowing in advance and for certain that they will receive a certain level of income payments for life regardless of investment risk.

Due to the high and increasing demand for living annuities in South Africa, the question could be raised whether financial advisors clearly articulate and emphasise the certainty benefit that guaranteed annuities provide. The certainty factor could not have been compared to previous studies, due to a lack of empirical evidence.

6.5.3.3 Mortality risk/early death

Mortality risk exerted the third strongest relationship (B = .192) to respondents' benefit perceptions of a guaranteed annuity. A positive relationship ($p<.05$) exists between low mortality risk perceptions and the benefit perceptions of a guaranteed annuity. Therefore, a low risk of dying early contributes positively to the benefit perceptions of a guaranteed annuity.

Mortality risk was measured by asking respondents six questions. The first question asked respondents whether they thought they would live long enough for a guaranteed annuity to be worthwhile[206] (If respondents agreed with this statement, they demonstrated low mortality risk). The second question asked respondents whether they feared running out of retirement capital before death (If respondents agreed with this statement, it demonstrated low mortality risk). The third to fifth questions asked respondents about their own survival probability to ages 75, 85 and 90 and beyond (If respondents agreed with these statements, it demonstrated low mortality risk). The sixth question asked respondents whether they were uncertain about their own biological survival prospects at retirement (If respondents disagreed with this statement, they demonstrated low mortality risk).[207]

As theory predicts, this study shows that low mortality risk, or a low risk of dying early, positively contributes to the benefit perceptions of guaranteed annuities. The impact of low mortality risk, as measured by health status, on people's optimal level of annuitisation was confirmed by Brown (2001), Gardner and Wadsworth (2004), Hurd and Panis (2006), as well as Cappelletti et al. (2013). Conversely, according to Inkmann et al. (2011), low mortality risk, as it relates to health status, is non-significant.

In the South African context, Rusconi (2006) and National Treasury (2012) suggested that guaranteed annuities provide poor value to those who are ill and expect to die relatively soon after retirement, as capital is lost in the event of death.

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[206] This item refers explicitly to a guaranteed annuity and is therefore only used to measure the relationship of mortality risk on the benefit perceptions of guaranteed annuities.

[207] The data generated by this question was reverse-coded before analysis.

6.5.3.4 Risk aversion

Low risk aversion exerted the fourth strongest relationship (B = -.181) to respondents' benefit perceptions of a guaranteed annuity. A negative relationship ($p<.05$) exists between low risk aversion and the benefit perceptions of a guaranteed annuity. Therefore, high risk aversion, contributes positively to the benefit perceptions of a guaranteed annuity.

Risk aversion was measured by asking respondents two questions. The first question asked respondents whether they prefer investments that offered high returns, even if it was risky (If respondents agreed with this statement they demonstrated low risk aversion or risk seeking tendencies). The second question asked respondents whether they tried to avoid financial risk (If respondents agreed with this statement, they demonstrated high risk aversion).

This study shows that individuals who are relatively more risk averse are more likely to view annuitisation as beneficial, as they value the longevity and investment risk protection offered by guaranteed annuities.

The relationship of high risk aversion to annuitisation intention was confirmed by Brown (2001), who showed that higher risk aversion leads to higher intentions to annuitise. Also, Bütler and Teppa (2007) as well as Inkmann et al. (2011) showed that higher risk aversion leads to higher levels of annuitisation. However, Cappelletti et al. (2013) found risk aversion to be non-significant with respect to annuitisation intent.

6.5.4 Statistically non-significant variables

The multiple regression results also show which factors are not significant to respondents' attitude towards guaranteed annuities. The following factors do not significantly contribute to the benefit perceptions of guaranteed annuities: (i) default risk_survival; (ii) default risk_diverse; (iii) insurance; (iv) mortality salience; (v) general patience; (vi) speed of financial decision-making; (vii) literacy; (viii) trust in financial advisors; and (ix) fairness. The investigation into the possible relationships between these factors (or independent variables), as they relate specifically to the benefit perceptions of guaranteed annuities, is the first such analysis appearing in the literature to the researcher's knowledge.

6.5.5 Test for robustness

If results are robust, they will hold and deliver similar results under a variety of conditions, even if the assumptions are altered or violated. To test for robustness, the analysis was repeated by including all independent variables and demographic variables into one multiple regression. The addition of the demographic variables did not change the main findings, conclusions and implications of the study.

6.5.6 Summary

In this analysis, the factors that relate to the benefit perceptions of guaranteed annuities were identified. It is evident from the multiple regression analysis that possessing knowledge and being aware of AIPs, contribute positively towards respondents' favourable viewpoint regarding annuitisation. In addition, the certainty of receiving a guaranteed income stream for life exerts a strong relationship to respondents' benefit perceptions of a guaranteed annuity. It therefore seems plausible, that such respondents appreciate the unequivocal advantages of mortality pooling and the protection guaranteed annuities afford against longevity and investment risk. Moreover, low mortality risk relates to respondents' benefit perceptions, as they might expect many guaranteed annuity income payments in future. Finally, high risk aversion contributes significantly towards a positive guaranteed annuity outlook, as respondents might appreciate the protection annuitisation affords against longevity and investment risk. In the next section, the factors (or independent variables) that relate to the intention to annuitise, are presented.

6.6 THE FACTORS THAT RELATE TO THE INTENTION TO ANNUITISE, OR NOT – PART 1(C)

For Part 1 of the study, the factors that relate to the intention to annuitise, or not, were identified. The dependent and independent variables represent the theoretical framework on which this empirical analysis is based, with the purpose of ascertaining which factors relate to the intention to annuitise.

The dependent variable refers to the binary decision of choosing either a guaranteed annuity (annuitising), or a living annuity (not annuitising). The independent (or predictor) variables are listed in Table 6.6 and consist of the items shown in Table E.3 (See Appendix E). All independent variables were measured as ordinal, or nearly continuous data, linked to a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree). As the respondents in Part 1 of the study have not yet reached retirement, they only have an intention to annuitise, or not. Descriptive statistics for all independent variables are given in Table F.3 (Appendix F).

A binary logistic regression was performed in SPSS in order to ascertain which factors relate to respondents' intention to annuitise (Option 2), or not (Option 1). The guaranteed annuity option was coded as 1 (annuitising), whereas the living annuity option is coded as 0 (not annuitising).

6.6.1 Factors that related to the intention to annuitise, or not

In order to identify the factors (or independent variables) that relate to/predict the intention to annuitise a logistic regression was performed in SPSS. When reporting the logistic regression results, the following statistics were analysed in order to assess the model's ability to predict the respondents' future decision:

i) **Hosmer-Lemeshow Goodness of Fit test** assessed the model's reliability or "goodness of fit" with a Chi-squared of 5.204 at a significance level of .736. The Hosmer-Lemeshow test therefore provides support for the model, as the significance level is more than .05.

ii) **Classification Table output**. Without the independent variables, the category (i.e. respondents choosing to annuitise, or not) was correctly predicted for 63.3% of the cases.[208] By adding the independent or predictor variables, the model's predictive ability increased to 89.4%. Deductively the independent variables improve the predictability of the model.

iii) **Cox & Snell and Nagelkerke R Squared**. These statistics are known as pseudo R squared statistics and provide an indication of the amount of variation in the dependent variable explained by the model. Accordingly, 54.4% to 74.3% of the variability in the dependent variable is explained by the independent variables.

The logistic regression results are summarised in Table 6.6. In Section 6.6.2, the relationships between the factors (independent variables) that relate to the intention to annuitise, are analysed.

[208] In effect a null model.

Table 6.6: Factors that related to the intention to annuitise

Independent variable	Beta-coefficient (B)	Standard Error (S.E.)	Wald test	Exp(B)[209]
CERTAINTY	1.623	.348	21.702***	5.068
BEQUEST MOTIVE	-1.234	.248	24.733***	.291
TRUST IN ADVISOR_GA	1.079	.319	11.448**	2.941
TRUST IN ADVISOR_LIV	-1.054	.318	10.994**	.348
RC MANAGE	-.671	.212	9.992**	.511
PAT_GEN	-.302	.159	3.598	.739
FIN_SPEED	.207	.146	2.007	1.231
LITERACY	.084	.297	.079	1.087
AWARENESS_NEW	-.219	.191	1.313	.803
RISK AVERSION (low)	.440	.238	3.429	1.553
INSURANCE	.006	.162	.002	1.006
FAIRNESS	-.168	.135	1.537	.845
DEFAULT RISK_SURVIVE (low)	-.258	.187	1.891	.773
DEFAULT RISK_DIVERSE (low)	-.050	.220	.051	.951
ACCESS_GEN	-.528	.274	3.717	.590
ACCESS_RC	.109	.184	.351	1.115
MORTALITY SALIENCE_LIV	.312	.213	2.147	1.366
MORTALITY SALIENCE_GA	-.270	.219	1.513	.764
BENEFIT_LIV	-.254	.232	1.201	.776
BENEFIT_GA	.515	.286	3.244	1.673
MORTALITY RISK (low)	.419	.243	2.960	1.520

*p<.05 **p<.01 ***p<.001

Source: Author's conception.

No logistic regression analysis assumptions were violated in a way that would invalidate results. Specifically, the data was tested for non-linearity between each independent variable and dependent variable. Although some variables indicated non-linearity, further analysis confirmed that the reported results were not influenced by such non-linear relationships. Multi-collinearity was also tested by investigating VIFs, and were all less than 5.

[209] The Exp(B) values represent odds ratios for each of the independent variables.

6.6.2 Hypotheses for factors that relate to the intention to annuitise

The following hypotheses[210] assess the relationship between the dependent and independent variables, as shown in Table 6.7.

Table 6.7: Hypotheses for the factors that relate to the intention to annuitise

	Independent variable[211]	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
1.	CERTAINTY	Directional (positive)	$H0^1$: The certainty that a guaranteed annuity provides, has no significant relationship on the intention to annuitise. **Ha^1: The certainty that a guaranteed annuity provides, has a significant relationship on the intention to annuitise.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, valuing the certainty provided by a guaranteed annuity product, significantly relates to the intention to annuitise.
2.	BEQUEST MOTIVE	Directional (negative)	$H0^2$: The bequest motive has no significant relationship on the intention to annuitise. **Ha^2: The bequest motive has a significant relationship on the intention to annuitise.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, the bequest motive significantly relates the intention to annuitise.
3.	TRUST IN ADVISOR_GA	Directional (positive)	$H0^3$: Trust in financial advisors selling guaranteed annuity products has no significant relationship on the intention to annuitise. **Ha^3: Trust in financial advisors selling guaranteed annuity products has a significant relationship on the intention to annuitise.**	The p-value is significant at the 1% confidence level (p = .001). The null hypothesis must therefore be rejected. Deductively, perceiving financial advisors selling guaranteed annuity products as trustworthy, significantly relates the intention to annuitise.
4.	TRUST IN ADVISOR_LIV	Directional (negative)	$H0^4$: Trust in financial advisors selling living annuity products has no significant relationship on the intention to annuitise. **Ha^4: Trust in financial advisors selling living annuity products has a significant relationship on the intention to annuitise.**	The p-value is significant at the 1% confidence level (p = .001). The null hypothesis must therefore be rejected. Deductively, perceiving financial advisors selling living annuity products as trustworthy, significantly relates the intention to annuitise.

[210] In all cases the null hypothesis was addressed.

[211] The development of variables is given in Section 5.5.4.

Table 6.7: Hypotheses for the factors that relate to the intention to annuitise (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
5.	RC MANAGE	Directional (negative)	$H0^5$: Managing retirement capital has no significant relationship on the intention to annuitise. **Ha^5: Managing retirement capital has a significant relationship on the intention to annuitise.**	The p-value is significant at the 1% confidence level (p = .002). The null hypothesis must therefore be rejected. Deductively, the control and flexibility to earn an above-average income from a living annuity due to the growth generated by the underlying investment portfolio, significantly relate to the intention to annuitise.
6.	PATIENCE_GEN	Null	**$H0^6$: General patience has no significant relationship on the intention to annuitise.** Ha^6: General patience has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
7.	FIN_SPEED	Null	**$H0^7$: Speed of financial decision-making has no significant relationship on the intention to annuitise.** Ha^7: Speed of financial decision-making has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
8.	LITERACY	Null	**$H0^8$: Financial literacy has no significant relationship on the intention to annuitise.** Ha^8: Financial literacy has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
9.	AWARENESS	Null	**$H0^9$: Awareness has no significant relationship on the intention to annuitise.** Ha^9: Awareness has a significant relationship on the intention to annuitise.	The p-value is non-significant (p>.05). The null hypothesis can therefore not be rejected.
10.	RISK AVERSION	Null	**$H0^{10}$: Risk aversion has no significant relationship on the intention to annuitise.** Ha^{10}: Risk aversion has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
11.	INSURANCE	Null	**$H0^{11}$: Life insurance has no significant relationship on the intention to annuitise.** Ha^{11}: Life insurance has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.

Table 6.7: Hypotheses for the factors that relate to the intention to annuitise (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
12.	FAIRNESS	Null	**$H0^{12}$: Fairness has no significant relationship on the intention to annuitise.** Ha^{12}: Fairness has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
13.	DEFAULT RISK_SURVIVE	Null	**$H0^{13}$: Default risk (survival of insurance companies) has no significant relationship on the intention to annuitise.** Ha^{13}: Default risk (survival of insurance companies) has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
14.	DEFAULT RISK_DIVERSE	Null	**$H0^{14}$: Default risk (insolvency) has no significant relationship on the intention to annuitise.** Ha^{14}: Default risk (insolvency) has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
15.	ACCESS_GEN	Null	**$H0^{15}$: Accessibility to capital in general has no significant relationship on the intention to annuitise.** Ha^{15}: Accessibility to capital in general has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
16.	ACCESS_RC	Null	**$H0^{16}$: Accessibility to retirement capital has no significant relationship on the intention to annuitise.** Ha^{16}: Accessibility to retirement capital has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
17.	MORTALITY SALIENCE_LIV	Null	**$H0^{17}$: Mortality salience in living annuities has no significant relationship on the intention to annuitise.** Ha^{17}: Mortality salience in living annuities has a significant relationship on the intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.

Table 6.7: Hypotheses for the factors that relate to the intention to annuitise (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
18.	MORTALITY SALIENCE_GA	Null	**$H0^{18}$: Mortality salience in guaranteed annuities has no significant relationship on the intention to annuitise.** Ha^{18}: Mortality salience in guaranteed annuities has a significant relationship on the intention to annuitise.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
19.	BENEFIT_LIV	Null	**$H0^{19}$: The benefit perceptions* of living annuities has no significant relationship on the intention to annuitise.** Ha^{19}: The benefit perceptions* of living annuities has a significant relationship on the intention to annuitise.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
20.	BENEFIT_GA	Null	**$H0^{20}$: The benefit perceptions* of guaranteed annuities has no significant relationship on the intention to annuitise.** Ha^{20}: The benefit perceptions* of guaranteed annuities has a significant relationship on the intention to annuitise.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
21.	MORTALITY RISK	Null	**$H0^{21}$: Mortality risk has no significant relationship on the intention to annuitise.** Ha^{21}: Mortality risk has a significant relationship on the intention to annuitise.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.

*As measured by peace of mind, return on investment and financial security.

Source: Author's conception.

From the 21 hypotheses, five proved to be statistically significant. The five factors that relate to the intention to annuitise, are further discussed in Section 6.6.3.

6.6.3 Factors that relate to the intention to annuitise

The five factors that significantly relate to respondents' decision to annuitise are summarised in Table 6.8: (i) certainty; (ii) bequest motive; (iii) trust in financial advisors selling guaranteed annuities; (iv) trust in financial advisors selling living annuities; and (v) managing retirement capital. These factors are discussed in detail in the following sections.

Table 6.8: Factors that relate to the intention to annuitise

Independent variable	Exp(B)	Calculation	Interpretation
CERTAINTY	5.068***		The odds of a person having an intention to annuitise are 5.068 times higher if he/she prefers the certainty that a guaranteed annuity product offers, all other factors being equal.
BEQUEST MOTIVE	.291***	1÷.291=3.44	If the bequest motive decreases by one unit, the intention to annuitise is 3.44 times higher.
TRUST IN ADVISOR_GA	2.941**		The odds of a person having the intention to annuitise are 2.941 times higher if he/she regards financial advisors selling guaranteed annuities as trustworthy, all other factors being equal.
TRUST IN ADVISOR_LIV	.348**	1÷.348=2.87	If the trustworthiness of financial advisors selling living annuities decreases by one unit, the intention to annuitise is 2.87 times higher.
RC MANAGE	.511**	1÷.511=1.96	If the perceived superiority of living annuity income payments decreases by one unit, the intention to annuitise is 1.96 times higher.

*p<.05 **p<.01 ***p<.001

Source: Author's conception.

6.6.3.1 Certainty

Certainty exerts the strongest relationship (B = 1.623) to respondents' intention to annuitise (See Table 6.6). The odds of a person having an intention to annuitise are 5.068 times higher if he/she prefers the certainty that a guaranteed annuity product offers, all other factors being equal (p<.001) (See Table 6.8). Thus, valuing the certainty provided by a guaranteed annuity product, positively relates to the intention to annuitise.

Certainty was measured by asking respondents three questions. The first question to measure certainty did not directly refer to a guaranteed annuity, but asked respondents whether they preferred to know exactly what their income stream would be in the future. The second question referred directly to a guaranteed annuity and asked respondents whether they preferred an income stream that ran automatically without any involvement from them. The third question did not refer directly to a guaranteed annuity and asked respondents whether they preferred an income stream that was

guaranteed for the rest of their lives. These questions measured whether the certainty of annuity income payments that are guaranteed for life, relates to respondents' annuitisation intent.

As expected, certainty also positively contributes to the benefit perceptions of a guaranteed annuity, according to the multiple regression analysis. Although the role of certainty on annuitisation intent has not been explored in previous studies, this result begs the question whether financial advisors advising clients on AIPs give this factor the acknowledgement it deserves.

6.6.3.2 Bequest motive

The bequest motive[212] exerts the second strongest relationship (B = -1.234) to respondents' intention to annuitise (See Table 6.6). The results indicate that, if the bequest motive decreases by one unit, intention to annuitise is 3.44 times higher ($p<.001$). Therefore, the bequest motive negatively relates to the intention to annuitise.

The bequest motive was measured by asking respondents three questions. The first question asked respondents whether it is important to them to leave remaining capital to heirs at death. The first question therefore had a narrow focus, by referring specifically to retirement capital, and not assets in general. It could be important to some to leave remaining capital to heirs at death for altruistic reasons or egotistical reasons.

The second question referred indirectly to the bequest motive. Potential heirs might be willing to fund the retiree should he/she run out of capital during his/her lifetime, in exchange for inheriting any money left in the annuitant's living annuity. Such a strategy refers to risk-sharing within families. Although this question focuses on the potential heir's bequest motive, the question was asked from the respondent's or (future) annuitant's perspective. The third question had a broader focus and measured the importance to respondents of leaving an inheritance to heirs in general. This question has an altruistic undertone as specific reference is made to heirs.

As expected, the bequest motive also positively contributes to the benefit perceptions of living annuities in the multiple regression analysis.[213] The bequest motive as a significant predictor of annuitisation intent/choice is not well supported in the international literature. Gardner and Wadsworth (2004) did however suggest that the bequest motive decreases the intention to annuitise. Although Brown (2001) and Cappelletti et al. (2013) who studied annuitisation intent found no evidence for the existence for the bequest motive, the proxy they used to test for a bequest motive, namely the presence of children, proved questionable, based on the argument that childless people could desire to leave bequests to heirs that are not their children.

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[212] The forces that underlie the bequest motive seem to be multi-faceted and include altruism, egoism (i.e. dying with a positive net wealth), and risk-sharing strategies (as often occurs between spouses).

[213] Benefit perceptions did not play a significant role in the decision to annuitise.

The existence of risk-sharing within families is also not well supported in international literature. Hayashi et al. (1996) found no empirical evidence of general risk-sharing between and within families. Risk-sharing between husband and wife is however fairly well documented, by several authors including: Brown (2001); Hurd and Panis (2006); Bütler and Teppa (2007); Inkmann et al. (2011).[214] However, Cappelletti et al. (2013) found no empirical evidence of risk-sharing between husband and wife.

Finally, according to anecdotal evidence by Rusconi (2006) and National Treasury (2012), private mortality pooling between spouses and families or other informal support networks could drive South Africans' preference for living annuities.

6.6.3.3 Trust in financial advisors selling guaranteed annuities

Trust in financial advisors selling guaranteed annuities exerts the third strongest relationship (B = 1.079) to respondents' intention to annuitise (See Table 6.6). The odds of a person having the intention to annuitise are 2.941 times higher if he/she regards financial advisors selling guaranteed annuities as trustworthy, all other factors being equal ($p<.01$) (See Table 6.8). Thus, perceiving financial advisors selling guaranteed annuity products as trustworthy, positively relates to the intention to annuitise.

Trust was measured by asking respondents two questions. In order to measure trust in financial advisors selling guaranteed annuities, the first question asked respondents whether they think financial advisors selling guaranteed annuities pursue only their own self-interested goals.[215] The second question asked respondents whether they believe financial advisors selling guaranteed annuities have their clients' best interests at heart. In order to establish trust, it is important for clients to believe that their financial advisor will act in good faith.

Whereas trust in financial advisors selling guaranteed annuities is statistically non-significant in respondents' benefit perceptions of a guaranteed annuity in the multiple regression analysis, trust in financial advisors selling living annuities is a significant factor with respect to the benefit perceptions of a living annuity. This could be because guaranteed annuities are low involvement products; once it has been sold, the contract runs automatically and does not require further decision-making. In contrast, financial advisors selling living annuities usually stay involved in the retirees' financial affairs to assist with asset and fund allocation as well as income withdrawal decision-making and implementation.

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[214] In further support of risk-sharing between husband and wife, 81.7 percent of the respondents choosing a living annuity are married, compared with 72.8 percent of the respondents choosing a guaranteed annuity.

[215] The data generated by this question was reverse-coded before analysis.

There are no known studies in the literature that investigated the role of trust in financial advisors promoting guaranteed annuities as a factor that relates to the intention to annuitise. As a factor that relates to AIP choice, trust in the financial advisors that sell any specific AIP is important. Financial advisors must therefore accept the trust placed in them with a great sense of responsibility and be fully aware of their obligation and duty to provide clients with sound AIP advice.

6.6.3.4 Trust in financial advisors selling living annuities

Trust in financial advisors selling living annuities exerts the fourth strongest relationship (B = -1.054) to respondents' intention to annuitise (See Table 6.6). If the trustworthiness of financial advisors selling living annuities decreases by one unit, intention to annuitise is 2.87 times higher (p<.01) (See Table 6.8). Hence, perceiving financial advisors selling living annuity products as trustworthy, negatively relates to the intention to annuitise.

Trust was measured by asking respondents two questions. In order to measure trust in financial advisors selling living annuities, the first question asked respondents whether they think financial advisors selling living annuities pursue only their own self-interested goals.[216] The second question asked respondents whether they believe financial advisors selling living annuities have their clients' best interests at heart. In order to establish trust, it is important for clients to believe that their financial advisor will act in good faith.

As expected, trust in financial advisors selling living annuities is also a significant contributor to the benefit perceptions of a living annuity, according to the multiple regression analysis, which could be explained by the high financial advisor involvement necessary to manage a living annuity.[217] There are no known studies in the literature that investigated the role of trust in financial advisors promoting living annuities as a factor that relates to the intention to annuitise.

6.6.3.5 Managing retirement capital

Managing retirement capital (RC Manage) exerts the fifth strongest relationship (B = -.671) to respondents' intention to annuitise (See Table 6.6). If the perceived superiority of income from managing living annuity capital decreases by one unit, intention to annuitise is 1.96 times higher (p<.05) (See Table 6.8). Therefore, perceiving the income that can be withdrawn from a living annuity as superior, negatively relates to the intention to annuitise.

RC Manage was measured by asking respondents two questions. The first question asked respondents whether they think they could do better by investing their retirement capital in a living annuity in order to benefit from capital growth. The second question asked respondents in broad terms whether they like the flexibility and control of managing a living annuity.

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[216] The data generated by this question was reverse-coded before analysis.

[217] This high involvement comes at a high cost to living annuitants. One of these costs is the fee paid to the financial advisor who manages the underlying investments of the living annuity product.

Respondents who think they can earn an above-average income, as well as generate capital growth from the investments underlying the living annuity, have high confidence levels in their own investment skills and/or the investment skills of financial advisors. They are thus more likely to view self-annuitisation as beneficial. As expected, RC manage also positively contributes to the benefit perceptions of a living annuity according to the multiple regression analysis.

Investor confidence as a factor related to annuity choice is well supported in the literature, from both a rational and behavioural perspective, as confirmed by Rusconi (2006), Brown et al. (2008), and National Treasury (2012). In addition, the results of flexibility as a significant contributor to the benefit perceptions of living annuities seem to be on par with international research. Gardner and Wadsworth (2004) suggested that the desire for flexibility is a key factor influencing the desirability of living annuities. In addition, Rusconi (2006) found that many individuals fully retire much later in life than previously. Therefore, the transition from full-time work to no work at all often happens gradually, in which case income flexibility is important.

6.6.4 Statistically non-significant variables

The following variables did not significantly relate to respondents' intention to annuitise:

i) **Patience_GEN and Fin_SPEED:** The non-significance of these factors are contradicted by the findings of Brown (2001) and Cappelletti et al. (2013) who offered evidence that impatient individuals intend not to annuitise.[218] Their findings were also echoed by Hurd and Panis (2006) who studied the annuity choice.

ii) **Financial literacy:** The non-significance of financial literacy on annuitisation intent is in contrast to the finding of Cappelletti et al. (2013), that lower financial literacy leads to lower intention to annuitise.

iii) **Awareness:** The non-significance of awareness seems to be at odds with the finding of Bateman et al. (2013), who showed that awareness positively influenced annuitisation intent.

iv) **Risk aversion (low):** Although also non-significant in Cappelletti et al. (2013), the non-significance of risk aversion is in contrast to the finding of Brown (2001) that higher risk aversion leads to a higher intention to annuitise (as also confirmed by Bütler and Teppa (2007) and Inkmann et al. (2011) who studied the annuity choice).

v) **Life insurance:** The non-significance of this factor contradicts the finding of Inkmann et al. (2011), who found that individuals who have life insurance cover, annuitise more.

vi) **Fairness:** This factor has, to the researcher's knowledge, not been directly investigated on a scientific basis, as a factor that relates to either annuitisation intent or choice.

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[218] As also alluded to by Gardner and Wadsworth (2004).

vii) **Default risk_SURVIVE and default risk_DIVERSE (low):** The non-significance of these factors contradict the findings of Brown (2001), Bütler and Teppa (2007), and Inkmann et al. (2011)[219] who showed that people who think it is improbable for an insurance company to default on annuity income payments, demonstrate risk-seeking behaviour, in which case self-annuitisation might be preferred. According to Schulze and Post (2010), default risk can either alleviate or intensify the annuity puzzle.

viii) **Accessibility_GEN and Accessibility_RC:** Accessibility, also referred to as the precautionary savings motive, has not been empirically investigated to assess its relationship to annuitisation intent or choice, to the researcher's knowledge.

ix) **Mortality salience:** The non-significance of this factor is in contrast to the finding of Salisbury and Nenkov (2016), that mortality salience negatively affected respondents' intention to annuitise.

x) **Benefit perceptions:** This factor has not been investigated in prior empirical studies on annuitisation intent, to the researcher's knowledge. This variable is an exploratory independent variable in the theoretical framework and refers to the dependent variables of living and guaranteed annuity benefit perceptions respectively, as measured by peace of mind, financial security and return on investment.

xi) **Mortality risk (low):** Mortality risk as measured by subjective survival probability was also non-significant in Brown (2001) (intent) and Hurd and Panis (2006) (choice). Inkmann et al. (2011), however, found that those who have higher self-reported survival to advanced ages, annuitise more.

6.6.5 Summary of factors that relate to the intention to annuitise

The five independent variables that most significantly contribute to the predictive ability of the model are: (i) the certainty provided by guaranteed annuity products (p = .000); (ii) the bequest motive (p = .000); (iii) the trustworthiness of advisors selling guaranteed annuities (p = .001); (iv) the trustworthiness of advisors selling living annuities (p = .001); and (v) the perceived superiority of managing the underlying capital of a living annuity (p = .002). These factors therefore represent the main factors that relate to a person's intention to annuitise, or not.

[219] Non-significant in Cappelletti et al. (2013).

6.6.6 The relationship of demographic variables to the intention to annuitise

The dependent variable refers to the binary decision of choosing either a guaranteed annuity (coded as 1) or a living annuity (coded as 0). The demographic (independent) variables are listed in Table 6.9.[220] All independent variables were inserted as binary variables mainly due to the skewness of the data, except for AGE and HEALTH. Table F.4 refers to the codes assigned to each response option (See Appendix F). AGE was measured as a continuous variable, and HEALTH was measured as a categorical variable and coded as follows: excellent health = 1; very good health = 2; good health = 3; and fair health = 4.

6.6.7 Assessing the performance of the model

In order to identify the demographic variables that relate to/predict the intention to annuitise, a logistic regression was performed in SPSS.

The following indices were used in order to assess the model's performance:

i) **Hosmer-Lemeshow Goodness of Fit test** proves the model's reliability or "goodness of fit". This model returned a Chi-squared of 10.006 at a significance level of .265. The Hosmer-Lemeshow test therefore provides support for the model, as the significance level is more than .05.

ii) **Classification Table output**. Without the independent variables, the category (i.e. respondents' decision to annuitise, or not) is correctly predicted for 63.3% of the cases (a null model). By adding the independent or predictor variables, the model's predictive ability increases to 66.6%. Deductively the independent variables marginally improve the predictability of the model.

iii) **Cox & Snell and Nagelkerke R Squared**. These statistics are known as pseudo R squared statistics and provide an indication of the amount of variation in the dependent variable explained by the model. Accordingly, 9.8% to 13.3% of the variability in the dependent variable is explained by the independent variables (the demographic characteristics of the sample).

The regression results are summarised in Table 6.9.

[220] A comparison of responses for demographic variables among annuitants who chose a living annuity or a guaranteed respectively, are given in Table F.4 (See Appendix F).

Table 6.9: The relationship of demographic variables to the intention to annuitise

Independent variable	Beta-coefficient (B)	Standard Error (S.E.)	Wald test	Exp(B)[221]
GENDER	.892	.277	10.396**	2.441
AGE	-.031	.015	4.490*	.969
HEALTH STATUS	.014	.147	.009	1.014
MARITAL STATUS	.040	.337	.014	1.041
INCOME STATUS	-.373	.297	1.580	.689
CHILDREN	.316	.368	.737	1.372
FINANCIAL DEPENDANTS	.120	.405	.088	1.127
DEGREE	-.522	.585	.795	.593
SHARES	.448	.312	2.063	1.565
LIFE POLICY	.565	.302	3.499	1.759
MEDICAL SCHEME	-.460	.840	.300	.631
HEALTH INSURANCE	-.477	.354	1.808	.620

*p<.05 **p<.01 ***p<.001

Source: Author's conception.

No logistic regression analysis assumptions were violated in a way that would invalidate the results.

[221] The Exp(B) values represent odds ratios for each of the independent variables.

Table 6.10: Hypotheses[222] for the demographic factors that relate to the intention to annuitise

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
1.	GENDER	Directional (positive)	$H0^1$: There is no relationship between being male and having an intention to annuitise. **Ha^1: There is a relationship between being male and having an intention to annuitise.**	The p-value is significant at the 1% confidence level (p = .001). The null hypothesis must therefore be rejected. Deductively, males have a significantly higher intention to annuitise, compared with females.
2.	AGE	Directional (negative)	$H0^2$: There is no relationship between age and having an intention to annuitise. **Ha^2: There is a relationship between age and having an intention to annuitise.**	The p-value is significant at the 5% confidence level (p = .034). The null hypothesis must therefore be rejected. Deductively, younger individuals have a significantly higher intention to annuitise.
3.	HEALTH STATUS	Null	**$H0^3$: There is no relationship between health status and having an intention to annuitise.** Ha^3: There is a negative relationship between health status and having an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
4.	MARITAL STATUS	Null	**$H0^4$: There is no relationship between being married and having an intention to annuitise.** Ha^4: There is a negative relationship between being married and having an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
5.	INCOME STATUS	Null	**$H0^5$: There is no relationship between income status and having an intention to annuitise.** Ha^5: There is a relationship between income status and having an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
6.	CHILDREN	Null	**$H0^6$: There is no relationship between having children/grandchildren and an intention to annuitise.** Ha^6: There is a relationship between having children/grandchildren and an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.

[222] In all cases the null hypothesis was addressed.

Table 6.10: Hypotheses for the demographic factors that relate to the intention to annuitise (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
7.	FINANCIAL DEPENDANTS	Null	**$H0^7$: There is no relationship between having financial dependants and an intention to annuitise.** Ha^7: There is a relationship between having financial dependants and an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
8.	DEGREE	Null	**$H0^8$: There is no relationship between having a degree and an intention to annuitise.** Ha^8: There is a relationship between having a degree and an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
9.	SHARES	Null	**$H0^9$: There is no relationship between having direct share market participation in personal capacity and an intention to annuitise.** Ha^9: There is a relationship between having direct share market participation in personal capacity and an intention to annuitise.	The p-value was non-significant (p > .05). The null hypothesis could therefore not be rejected.
10.	LIFE POLICY	Null	**$H0^{10}$: There is no relationship between having a life insurance policy and an intention to annuitise.** Ha^{10}: There is a relationship between having a life insurance policy and an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
11.	MEDICAL SCHEME	Null	**$H0^{11}$: There is no relationship between having a medical scheme membership and an intention to annuitise.** Ha^{11}: There is a relationship between having a medical scheme membership and an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
12.	HEALTH INSURANCE	Null	**$H0^{12}$: There is no relationship between having health insurance and an intention to annuitise.** Ha^{12}: There is a relationship between having health insurance and an intention to annuitise.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.

Source: Author's conception.

6.6.8 Demographic predictors of intention to annuitise

As seen in Table 6.11, the following factors significantly predict the intention to annuitise: (i) gender, and (ii) age. These are discussed in detail in the following sections.

Table 6.11: Factors that relate to the intention to annuitise

Independent variable	Exp(B)	Interpretation
GENDER	2.441**	The odds of a person having an intention to annuitise are 2.441 times higher if he was male, all other factors being equal.
AGE	.969*	If age decreases by one unit (year), the intention to annuitise is 1.03 times higher.

*p<.05 **p<.01 ***p<.001

Source: Author's conception.

6.6.8.1 Gender

Gender is the most significant demographic factor that can be regarded as a predictor of an individual's intention to annuitise. The odds of a person having an intention to annuitise are 2.441 times higher if he/she is male, rather than a female, all other factors being equal (p<.01). Although non-significant in Brown (2001) who studied annuitisation intent, Hurd and Panis (2006) as well as Bütler and Teppa (2007) also found that females cash-out[223] more.

6.6.8.2 Age

Age is the second-most significant demographic factor that could be regarded as a predictor of an individual's intention to annuitise. If age decreases by one unit (year), the intention to annuitise is 1.03 times higher (p<.05). This is in line with the finding of Brown (2001), that younger individuals have a higher intention to annuitise. However, Cappelletti et al. (2013) found age to be non-significant.

6.6.9 Statistically non-significant variables

The following variables did not significantly relate to respondents' intention to annuitise:

i) **Marital status:** The married to unmarried ratio is 244:67. Of married respondents, 81.7% chose a living annuity. In contrast, 72.8% of respondents who chose a guaranteed annuity were married. The non-significance of marriage is in contrast to international evidence. Specifically, Brown (2001) found that single individuals are more likely to annuitise (intent). The same applies to Hurd and Panis (2006), Bütler and Teppa (2007) as well as Inkmann et al. (2011) who studied the annuity choice. Cappelletti et al. (2013), however, found marital status to be non-significant with respect to annuitisation intent.

[223] In international empirical studies, reference is made to cashing-out, as opposed to self-annuitising.

ii) **Health status:** The poor health to good health ratio is 1:310 (self-classification). No respondents who chose either a living or a guaranteed annuity reported to be in poor health. The following three authors all agreed that individuals in poor health annuitise less: Brown (2001); Gardner and Wadsworth (2004) and Cappelletti et al. (2013). Although non-significant in Inkmann et al. (2011), Hurd and Panis (2006) also found that individuals in poor health cash-out more.

iii) **Income status:** The high to low income ratio is 206:105. Of the respondents who chose a living annuity, 65.4% put themselves in the higher income bracket. In comparison, 67.6% of respondents who chose a guaranteed annuity fell into the higher income bracket. The international empirical studies as tabulated in Table 4.2 and Table 4.3 show mixed evidence with respect to income levels. In the study by Brown (2001), wealthier individuals are less likely to annuitise. In contrast, in the studies of Gardner and Wadsworth (2004) as well as Cappelletti et al. (2013), more income and wealth are positively related to the intention to annuitise. On the other hand, as it relates to choice, wealthier individuals choose to annuitise more (Hurd & Panis, 2006; Bütler & Teppa, 2007; Inkmann et al., 2011).

iv) **Children/grandchildren:** The children/grandchildren to no children/grandchildren ratio in the sample is 254: 57. The mean number of children/grandchildren for respondents who chose a living annuity versus a guaranteed annuity are 2.50 and 1.89 respectively. The results from international empirical results as given in Table 4.2 and Table 4.3 also show that the presence of children do not significantly influence annuitisation intent (Brown, 2001; Cappelletti et al., 2013) or choice (Bütler & Teppa, 2007; Inkmann et al., 2011).

v) **Financial dependants:** The ratio of respondents with financial dependants to those with no financial dependants is 266:45. The mean number of financial dependants for respondents who chose a living annuity versus a guaranteed annuity is 2.17 and 1.97 respectively. Although financial dependants have not been investigated in international empirical studies listed in Table 4.2 and Table 4.3 *per se*, smaller households intend to annuitise more.

vi) **Higher educational qualification:** The ratio of respondents with a certificate/diploma/degree to those with no certificate/diploma/degree is 287:24. Even though Hurd and Panis (2006) found education to be non-significant, the less-educated annuitised less. Similarly, Inkmann et al. (2011) found higher levels of education had a positive influence on annuitisation intent.

vii) **Share market participation:** The direct share market participation to no direct share market participation ratio in the sample is 79:232. Of the respondents who chose a living annuity, 28.4% participate directly in the share market, compared with only 20.2% of respondents who chose a guaranteed annuity. Inkmann et al. (2011) found that individuals who participate in the share market, annuitise more. In contrast, Cappelletti et al. (2013) found share market participation to negatively influence intention to annuitise.

viii) **Life insurance:**[224] The ratio of ownership of a life insurance policy to no life insurance policy is 228:83. The non-significance of having life insurance as a factor that relates to annuitisation intent is in contrast with the finding of Inkmann et al. (2011) that those who participate in life insurance markets, annuitise more.

ix) **Medical scheme membership:** The medical scheme membership to no medical scheme membership ratio is 301:10. Approximately 96 percent of respondents who chose a living annuity have medical scheme membership, and approximately 98 percent of respondents who chose a guaranteed annuity have medical scheme membership. Medical scheme membership was not investigated *per se* in the international empirical studies described in Table 4.2 and Table 4.3.

x) **Health insurance:** The health insurance to no health insurance ratio is 249:62. Of the respondents who chose a living annuity, 76.6% had health insurance in place, and 86% of respondents who chose a guaranteed annuity had health insurance in place. This factor was not investigated in the international empirical studies summarised in Table 4.2 and Table 4.3.

As the sample is skewed towards those who are married, healthier, in the higher income brackets, more educated, and with children/grandchildren as well as financial dependants, the spread of the data makes it more difficult to uncover relationships between the variables. In a less skewed or concentrated data sample, some additional relationships may have proved statistically significant. It would also be valuable to see how the results would differ if the data is less skewed in terms of share market participation, life insurance, medical scheme membership and health insurance.

6.6.10 Summary of demographic factors that relate to the intention to annuitise

With respect to demographic independent variables, males can be predicted to have a significantly higher intention to annuitise, compared with females. Also, the intention to annuitise seems to decrease with age.

This study also confirms that the presence of children/grandchildren, irrespective whether they are financial dependants, does not significantly predict annuitisation intent.[225]

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[224] Out of respondents who chose a living annuity, 74.6% intended on keeping their group life insurance compared to 71.1% of respondents who chose a guaranteed option.

[225] This was also found in Brown (2001) and Cappelletti et al. (2013) who studied annuitisation intent and Bütler and Teppa (2007) and Inkmann et al. (2011) who studied annuity choice.

6.6.11 Summary

In this analysis, the factors that relate to the intention to annuitise, or not, were identified. By performing a logistic regression analysis in SPSS, five factors (independent variables) were found to relate to the intention to annuitise significantly. Three of the five factors decreased the likelihood of annuitisation and two factors increased the likelihood of annuitisation.

Decreasing factors represent: (i) the bequest motive; (ii) the trustworthiness/integrity of advisors selling living annuities; and (iii) the perceived superiority of income from a living annuity as achieved by managing the growth of your own retirement capital.

Increasing factors represent: (i) the certainty of annuity income payments without any further involvement from the annuitant; and (ii) trust in the integrity of financial advisors selling guaranteed annuities.

With respect to demographic independent variables, males have a significantly higher intention to annuitise, compared with females. Also, the intention to annuitise seems to decrease with age. This study also confirms that the presence of children/grandchildren, irrespective whether they are financial dependants, does not significantly predict annuitisation intent.[226]

In the next chapter, in order to complete the investigation into annuity decision-making, the factors that are associated with retirees' satisfaction levels in retirement, as they relate to the outcome of their AIP choice, are identified.

6.7 TEST FOR ROBUSTNESS

If results are robust, they will hold and deliver similar results under a variety of conditions, even if the assumptions are altered or violated. To test for robustness, the analysis in Section 6.6 was repeated by including all independent variables and demographic variables into one logistic regression. The addition of the demographic variables did not change the main findings, conclusions and implications of the study.

[226] This was also found in Brown (2001) and Cappelletti et al. (2013) who studied annuitisation intent and Bütler and Teppa (2007) and Inkmann et al. (2011) who studied annuity choice.

CHAPTER 7:
RESULTS – PART 2

7.1 INTRODUCTION

According to a substantial body of literature on the standard life-cycle model of consumption-saving behaviour, utility maximisation is achieved when a substantial portion of retirement wealth is annuitised.[227] However, according to the annuity puzzle, very few retirees avail themselves of the lifetime income stream that guaranteed annuities offer.

There seems to be very little empirical research focusing on the satisfaction levels of retirees relating to their retirement income strategies. Most notably, Panis (2004), Bender and Jivan (2005) as well as more recently, Nyce and Quade (2012), empirically investigated the effect of a guaranteed lifetime income stream on retirement satisfaction levels.[228]

Part 1 of the study identified the factors that relate to annuity perception and annuitisation intent. Part 2 investigated the factors that associate with annuitant satisfaction levels (dependent variable), as they relate to the eventual outcome of their AIP choice. The dependent and independent variables represent the theoretical framework on which this empirical analysis is based, with the purpose of ascertaining which factors associate with the satisfaction levels of living annuitants. The dependent variable[229] measures overall satisfaction with respect to AIP choice and was measured by the following eight items:

(i) *I am satisfied with my chosen retirement income option;*
(ii) *I feel regret towards my choice of retirement income option;*
(iii) *I would choose a different retirement income option, if I could choose again;*
(iv) *I would change to a different retirement income option in the future, if possible;*
(v) *I feel anxious about my financial future;*
(vi) *I feel comfortable about my financial future;*
(vii) *I feel hopeful about my financial future;*
(viii) *I worry about my financial future.*[230]

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[227] See, for instance, Yaari (1965); Friedman and Warskawsky (1988; 1990); Davidoff et al. (2005).

[228] A guaranteed lifetime income stream in these studies refers mostly to defined benefit pension pay-outs, and only in some cases are guaranteed annuities included.

[229] Nearly continuous data.

[230] These items were derived from previous studies assessing respondents' satisfaction levels as it pertains to their chosen AIP. See for example Panis (2004) in Section 4.6, who used the HRS to analyse satisfaction levels during retirement. The questions in this study are derived from the HRS but makes specific reference to the respondent's AIP choice. Furthermore, where Panis (2004) also used depression symptoms to measure satisfaction levels, this study measures respondents' emotions/feelings regarding their financial future specifically.

The independent variables are listed in Table 7.1 and consist of the items shown in Table E.4 (See Appendix E). All independent variables were measured as ordinal, or nearly continuous data, linked to a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree). Descriptive statistics for all factors are given in Table F.5 (Appendix F).

A multiple regression was performed using SPSS in order to ascertain which factors associate with the satisfaction levels of respondents who had chosen a living annuity (Option 1) at retirement. As there are 16 independent variables, a minimum sample size of approximately 146 respondents was required (Stevens, 1996: 72).[231]

The results for Part 2 are summarised as follows: Section 7.2 discusses survey participation and response rates. Section 7.3 explains the measurement reliability in Part 2. The factors that are associated with retirees' satisfaction levels relating to the eventual outcome of their annuity choice, are summarised in Section 7.4 to Section 7.8. In Part 2 of this study, the potential differences in the mean satisfaction of retirees categorised in a certain demographic group are described in Section 7.9 to Section 7.11. Section 7.12 provides evidence for the robustness of the results and Section 7.13 summarises this chapter.

7.2 SURVEY PARTICIPATION AND RESPONSE RATES

In Part 2, in order to identify the factors that are associated with retirees' satisfaction levels relating to their annuity choice,[232] a second questionnaire was distributed to pensioners consisting of two sub-samples:

- 400 former employees of SU, who are fully retired from the USRF; and
- 4 500 Sanlam (Glacier) annuity clients, who receive either living or guaranteed annuity income, or a combination of both living and guaranteed annuity income.

Out of the 44 USRF pensioners who completed the survey, 39 respondents (≈88% of the sample) had chosen a living annuity, 2 respondents (≈5% of the sample) had chosen a guaranteed annuity and 3 respondents (≈7% of the sample) had chosen a combined strategy. Out of the 259 Glacier annuitants who completed the survey, 190 respondents (≈73% of the sample) had chosen a living annuity, 10 respondents (≈4% of the sample) had chosen a guaranteed annuity and 59 respondents (≈23% of the sample) had chosen a combined strategy.

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[231] The required sample size is calculated as 50 + (6 x 16).

[232] In Part 1 of this study, respondents' pre-retirement annuity perceptions and intentions were investigated as they had not yet reached their retirement.

Out of the 303 respondents who completed the survey in total, 229 respondents (≈75% of the sample) had chosen a living annuity.[233] Unfortunately, a multiple regression could not be performed in order to ascertain which factors associate with satisfaction levels of respondents who had chosen either a guaranteed annuity (Option 2)[234] or a combination of both a living and guaranteed annuity (Option 3),[235] due to insufficient sample size. Even if the respondents who had chosen a guaranteed annuity were combined with respondents who had chosen a blended AIP consisting of both a living and guaranteed annuity, the total sample size of 74 is still insufficient to perform a multiple regression analysis.[236] Consequently, data from 229 respondents who had chosen a living annuity was analysed.[237] The response rates for the two groups were approximately 11 percent (USRF) and 5 percent (Glacier).

7.3 MEASUREMENT RELIABILITY IN PART 2

Due to the exploratory nature of Part 2, the internal consistency of factors was evaluated after the data was collected, in order to assess measurement reliability. Hence, the Cronbach's alpha[238] (CA) was calculated for each construct/scale. In this study, due to the novelty of Part 2 and the subsequent absence of validated scales[239] a Cronbach's alpha of .5 was deemed acceptable per construct/variable. Since Cronbach's alpha does not necessarily imply unidimensional (or homogenous)[240] scales, additional exploratory factor analyses (EFA) were performed in SPSS for constructs with multidimensional (or heterogeneous)[241] scales.[242] New constructs were developed from the EFA performed. Also, some constructs were split and a few items were deleted as a result of the EFA.

The same process to ensure measurement reliability was performed in Part 1 of this study, where some of the independent variables/factors as depicted in Figure 5.2 and Figure 5.4 were amended. The independent variables/factors used in Part 2 of this study reflect the amended independent variables/factors used in Part 1. See Table 7.1 for a depiction, followed by a discussion of how each variable was formed in Part 2.

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[233] In order to ensure the integrity of the data, 48 respondents' answers were removed from the dataset due to inconsistencies.

[234] The sample consists of only 12 respondents.

[235] The sample consists of only 62 respondents.

[236] The required sample size would be calculated as 50 + (6 x 16) = 146.

[237] The empirical investigation into the factors that is associated with retirees' satisfaction levels relating to their choice to self-annuitise is, to the researcher's knowledge, the first such analysis found in the literature.

[238] As developed by Cronbach (1951).

[239] Increasing the number of items in the scale could increase the CAs to more satisfactory levels, as CAs are very sensitive to scales containing fewer than 10 items (Nunnally & Bernstein, 1994: 265; Pallant, 2010: 97).

[240] This occurs when a set of items measures the same construct/scale.

[241] This occurs when items measuring different factors/constructs have high correlations.

[242] As advocated by Cronbach and Shavelson (2004: 413).

Table 7.1: Dependent and independent variables for Part 2

Variables	Items	Cronbach's alpha (CA)	Newly-formed scale (items included; CA)
RC MANAGE	INV2 FLEX1	.747	N/A
BEQUEST MOTIVE	BQM1 BQM2 BQM3	.484 (.744 if BQM2 removed)	Inter-item correlations within acceptable range of between .2 and .4, except for BQM2[243]
ACCESS_GEN	ACC2	N/A	N/A
ACCESS_RC	ACC1	N/A	N/A
MORTALITY RISK	MORT_NEW MORT2 MORT4 MORT5 MORT6	.369	MORT_EST (MORT4 & MORT5; .863)
			FEAR OUTLIVE (MORT2)
TRUST	TRUST2 TRUST4	.752	N/A
SALIENT	MSAL2	N/A	N/A
PATIENT_GEN	PAT1	N/A	N/A
FIN_SPEED	PAT2	N/A	N/A
LITERACY	FINL1 FINL2 FINL3 FINL4	.555	Inter-item correlations within acceptable range of between .2 and .4.
AIP AWARENESS	CONS1 CONS3	.728	N/A
AWARENESS_LIV	CONS_LIV	N/A	N/A
RISK AVERSION	AVER1 AVER2	.578	N/A
INFLUENCE	INFL2 INFL4 INFL6	.586	N/A
POST BENEFIT PERCEPTION	POM FINS ROI	.861	N/A

[243] Despite the low CA with item BQM2 included, the original scale including BQM2 was retained.

Table 7.1: Dependent and independent variables for Part 2 (continued)

Variables	Items	Cronbach's alpha (CA)	Newly-formed scale (items included; CA)
SATISFACTION[244]	SAT1 SAT2 SAT3 SAT4 SAT5 SAT6 SAT7 SAT8	.895	N/A

Source: Author's conception.

The first column in Table 7.1 represents the constructs/variables (Part 2). The second column in Table 7.1 contains the items (or questions) that measure each construct/variable. Should the Cronbach's alpha for any specific construct/variable, as shown in the third column in Table 7.1, be above .5, the construct/variable remained unchanged and no further action was required.[245] However, if the Cronbach's alpha for a specific construct/variable is below .5, an EFA was conducted in SPSS which, in some cases, resulted in new constructs. The following sections describe the process followed to finalise each construct/variable in Part 2.

7.3.1 RC Manage

RC Manage was measured by the following two questions:

(i) I would probably do better by investing my retirement capital in a living annuity, because my capital would have the potential to grow.

(ii) I like the flexibility and control of managing a living annuity.

The Cronbach's alpha for the RC Manage scale was .747, which is above the minimum acceptable level of .5.

[244] Satisfaction refers to the dependent variable.

[245] Hence N/A in column four in Table 7.1.

7.3.2 Bequest motive

The bequest motive was measured by the following three questions:

(i) *At death, it is important to me to leave my remaining retirement capital to my heirs*.

(ii) *My family would fund any shortfall I might have in retirement, in return for inheriting any money left in my living annuity*.

(iii) *It is important to me to leave an inheritance to my heirs at death.*

The Cronbach's alpha for the bequest motive scale was .484, which is below the minimal acceptable level of .5. According to the Cronbach's alpha results as produced by SPSS, if BQM2 is removed, the Cronbach's alpha improved to .744. Despite inter-item correlations being between the acceptable range of between .2 and .4 (except for BQM2), the researcher decided to retain the construct unchanged, as the Cronbach's alpha was close enough to the minimal acceptable level (CA = .484).

7.3.3 Accessibility_GEN

Accessibility_GEN was measured by the following questions/item:

(i) *It is important to have access to cash during retirement for emergencies*.

No further action was required.

7.3.4 Accessibility_RC

Accessibility_RC was measured by the following questions/item:

(i) *A living annuity is desirable as it allows me access to my retirement capital to pay for unforeseen expenses – for example, medical costs or home repairs.*

No further action was required.

7.3.5 Mortality risk[246]

Mortality risk was measured by the following five questions:

(i) *I fear dying soon.*[247]

(ii) *I fear outliving my retirement capital.*

(iii) *It is likely that I survive to age 85.*

(iv) *It is likely that I survive to age 90 and beyond.*

(v) *I am uncertain about my own biological survival prospects at retirement.*

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[246] MORT3 was not included in Part 2 as many of the respondents were already close to age 75 (or older). MORT1 was also left out of account in Part 2, as it measures mortality risk specifically for life annuitants.

[247] MORT_NEW is a new item that was added in Part 2.

The Cronbach's alpha for the mortality risk scale is .369, which is below the minimal acceptable level of .5. After an EFA was performed in SPSS, these were included as single items, as follows: (i) subjective mortality estimation (CA = .863); and (ii) fear of outliving retirement capital.

7.3.6 Trust in advisor selling living annuities

Trust in financial advisor was measured by the following two questions:

(i) *Financial advisors selling living annuities pursue only their own self-interested goals*.

(ii) *I believe that financial advisors selling living annuities have their clients' best interests at heart*.

The Cronbach's alpha for the trust scale is .752, which is above the minimal acceptable level of .5.

7.3.7 Mortality salience

Mortality salience with respect to a living annuity was measured by the following item:

(i) A living annuity makes me think about my own death.

No further action was required.

7.3.8 Patience_GEN

Patience was measured by the following item:

(i) I regard myself as someone who is patient.

No further action was required.

7.3.9 FIN_Speed

Speed of financial decision-making was measured by the following item:

(i) I make financial planning decisions quickly.

No further action was required.

7.3.10 Literacy

Literacy was measured by the following four questions:

(i) Investing in retirement funds has the same tax advantages as other investment funds;

(ii) All retirement funds guarantee to pay retirees a pension until their death;

(iii) It makes sense to invest money in the shares of more than one company;

(iv) Pension fund law prohibits retirement funds to invest in shares.

The Cronbach's alpha for the literacy scale is .555, which is above the minimal acceptable level of .5. Also, the inter-item correlations are within the acceptable range of between .2 and .4.

7.3.11 AIP Awareness

Awareness was measured by the following two questions:

(i) I am familiar with retirement income options.

(ii) I educate myself on retirement income options.

The Cronbach's alpha for the AIP awareness scale is .728, which is above the minimal acceptable level of .5.

7.3.12 Awareness_LIV[248]

Awareness about living annuity products specifically was measured by the following item:

(i) I am familiar with a living annuity as a retirement income option.

No further action was required.

7.3.13 Risk aversion

Risk aversion was measured by the following two questions:

(i) I prefer investments that offer high returns, even if it is a risky decision.

(ii) I try to avoid financial risk.

The Cronbach's alpha for the risk aversion scale is .578, which is above the minimal acceptable level of .5.

7.3.14 Influence[249]

Influence was measured by the following three questions:

(i) Most people I ask recommend a living annuity.

(ii) My financial advisor recommends a living annuity.

(iii) A living annuity, as far as I know, is the most popular retirement income option.

The Cronbach's alpha for the influence scale is .586, which is above the minimal acceptable level of .5.

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[248] This variable was not included in Part 1 as familiarity with retirement income options were referred to more generally (See AIP awareness, consisting of CONS1 and CONS3).

[249] This variable was not included in Part 1, as it refers to the influence of society on retiree's AIP choice.

7.3.15 Post-benefit perception[250]

Post-benefit perception was measured by the following three questions:

(i) *The retirement income option I have chosen gives me peace of mind.*

(ii) *The retirement income option I have chosen gives me a fair return on my investment.*

(iii) *The retirement income option I have chosen gives me a sense of financial security.*

The Cronbach's alpha for the post benefit perception scale is .861, which is above the minimal acceptable level of .5.

7.3.16 Satisfaction[251]

Satisfaction was measured by the following eight questions:

(i) *I am satisfied with my chosen retirement income option.*

(ii) *I feel regret towards my choice of retirement income option.*

(iii) *I would choose a different retirement income option, if I could choose again.*

(iv) *I would change to a different retirement income option in the future, if possible.*

(v) *I feel anxious about my financial future.*

(vi) *I feel comfortable about my financial future.*

(vii) *I feel hopeful about my financial future.*

(viii) *I worry about my financial future.*

The Cronbach's alpha for the satisfaction scale is .895, which is above the minimal acceptable level of .5.

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[250] This variable is similar to the benefit perceptions of respectively living and guaranteed annuities in Part 1. Post-benefit perceptions refer to the respondents' perceptions after they have made an AIP choice.

[251] Dependent variable.

7.4 THE SATISFACTION LEVELS OF LIVING ANNUITANTS

According to the multiple regression results reported in Table 7.2, the R squared, which refers to the amount of variation in the dependent variable (satisfaction levels) explained by the independent variables, amounts to 61.60 percent. The standard error of the estimate is within the acceptable range of +2 and -2 (SE = .77526). The smaller the SE, the more accurate the Beta-coefficients. The F-statistic is 21.219 (p<.001), which indicates that the proposed model has a good fit.

Table 7.2: Factors that relate to the satisfaction levels of living annuitants

Independent variable	Beta-coefficient (B)	t-statistic	Collinearity statistics	
			Tolerance	VIF
BENEFIT_POST	.556	9.029***	.477	2.096
FEAR OUTLIVE	-.313	-6.836***	.866	1.154
LITERACY	.208	4.037***	.680	1.471
AWARE_AIP	.177	3.422**	.681	1.469
MANAGE_RC	-.151	-2.689**	.572	1.748
AWARE_LIV	.128	2.383*	.629	1.589
MORTALITY RISK	.096	2.171*	.936	1.069
TRUST IN ADVISOR	-.047	-.974	.771	1.297
ACCESS_GEN	-.077	-1.639	.824	1.214
ACCESS_RC	.034	.720	.819	1.221
BEQUEST MOTIVE	.018	.369	.777	1.287
MORTALITY SALIENCE	-.036	-.800	.910	1.099
PATIENCE_GEN	.024	.517	.855	1.170
FIN_SPEED	.080	1.710	.830	1.205
RISK AVERSION	-.083	-1.745	.795	1.257
INFLUENCE	.069	1.456	.803	1.246

*p<.05 **p<.01 ***p<.001

Source: Author's conception.

No multiple regression analysis assumptions were violated in a way that would invalidate results. Specifically, the data was tested for non-linearity. Although some variables indicated non-linearity, further analysis confirmed that the reported results were not influenced by such non-linear relationships.

The possibility of multi-collinearity among independent variables was also investigated using the tolerance and VIF collinearity statistics produced by SPSS. As shown in Table 7.2, tolerance values are not less than .10 and VIF values are not above 10. Therefore, inferences made about the relationship between the independent variables on the dependent variable, as measured by the Beta-coefficients, can be interpreted with confidence.

7.5 HYPOTHESES FOR THE SATISFACTION LEVELS OF LIVING ANNUITANTS

The following hypotheses[252] were tested in order to explore the relationship between the dependent and independent variables as shown in Table 7.3.

Table 7.3: Hypotheses for the satisfaction levels of living annuitants

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
1.	BENEFIT_POST	Directional (positive)	$H0^1$: There is no relationship between the post-retirement benefit perceptions of a living annuity and the satisfaction levels of living annuitants. **Ha^1: There is a relationship between the post-retirement benefit perceptions of a living annuity and the satisfaction levels of living annuitants.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, perceiving a living annuity as beneficial in retirement contributes positively to satisfaction levels.
2.	FEAR OUTLIVE	Directional (negative)	$H0^2$: There is no relationship between the fear of outliving retirement capital and the satisfaction levels of living annuitants. **Ha^2: There is a relationship between the fear of outliving retirement capital and the satisfaction levels of living annuitants.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, the fear of outliving retirement capital reduces satisfaction levels.
3.	LITERACY	Directional (positive)	$H0^3$: There is no relationship between financial literacy and the satisfaction levels of living annuitants. **Ha^3: There is a relationship between financial literacy and the satisfaction levels of living annuitants.**	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, financial literacy contributes positively to satisfaction levels.
4.	AWARE_AIP	Directional (positive)	$H0^4$: There is no relationship between general annuity income product awareness and satisfaction levels of living annuitants. **Ha^4: There is a relationship between general annuity income product awareness and satisfaction levels of living annuitants.**	The p-value is significant at the 1% confidence level (p = .001). The null hypothesis must therefore be rejected. Deductively, AIP awareness increases satisfaction levels.

[252] In all cases the null hypothesis was addressed.

Table 7.3: Hypotheses for the satisfaction levels of living annuitants (continued)

	Independent variable	Type of hypothesis	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
5.	MANAGE_RC	Directional (negative)	H0[5]: There is no relationship between the control and flexibility to grow retirement capital and the satisfaction levels of living annuitants. **Ha[5]: There is a relationship between the control and flexibility to grow retirement capital and the satisfaction levels of living annuitants.**	The p-value is significant at the 1% confidence level (p = .008). The null hypothesis must therefore be rejected. Deductively, the control and flexibility to grow retirement capital within a living annuity, diminish satisfaction levels.
6.	AWARE_LIV	Directional (positive)	H0[6]: There is no relationship between living annuity product awareness and satisfaction levels of living annuitants. **Ha[6]: There is a relationship between living annuity product awareness and satisfaction levels of living annuitants.**	The p-value is significant at the 5% confidence level (p = .018). The null hypothesis must therefore be rejected. Deductively, living annuity product awareness heightens satisfaction levels.
7.	MORTALITY RISK (low)	Directional (positive)	H0[7]: There is no relationship between low mortality risk and the satisfaction levels of living annuitants. **Ha[7]: There is a relationship between mortality risk and the satisfaction levels of living annuitants.**	The p-value is significant at the 5% confidence level (p = .031). The null hypothesis must therefore be rejected. Deductively, having a low self-estimated risk of dying enhances satisfaction levels.
8.	TRUST IN ADVISOR_LIV	Null	**H0[8]: There is no relationship between trusting financial advisors selling living annuities and the satisfaction levels of living annuitants.** Ha[8]: There is a relationship between trusting financial advisors selling living annuities and the satisfaction levels of living annuitants.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
9.	ACCESS_GEN	Null	**H0[9]: There is no relationship between general accessibility to capital and the satisfaction levels of living annuitants.** Ha[9]: There is a relationship between general capital accessibility and satisfaction levels of living annuitants.	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.

Table 7.3: Hypotheses for the satisfaction levels of living annuitants (continued)

	Independent variable	Type of hypothesis	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
10.	ACCESS_RC	Null	**$H0^{10}$: There is no relationship between retirement capital accessibility and the satisfaction levels of living annuitants.** Ha^{10}: There is a relationship between retirement capital accessibility and satisfaction levels of living annuitants.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
11.	BEQUEST MOTIVE	Null	**$H0^{11}$: There is no relationship between the bequest motive and the satisfaction levels of living annuitants.** Ha^{11}: There is a relationship between the bequest motive and the satisfaction levels of living annuitants.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
12.	MORTALITY SALIENCE	Null	**$H0^{12}$: There is no relationship between mortality salience and the satisfaction levels of living annuitants.** Ha^{12}: There is a relationship between mortality salience and the satisfaction levels of living annuitants.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
13.	PATIENCE_GEN	Null	**$H0^{13}$: There is no relationship between general patience and the satisfaction levels of living annuitants.** Ha^{13}: There is a relationship between general patience and the satisfaction levels of living annuitants.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
14.	FIN_SPEED	Null	**$H0^{14}$: There is no relationship between speed of financial decision-making and the satisfaction levels of living annuitants.** Ha^{14}: There is a relationship between speed of financial decision-making and the satisfaction levels of living annuitants.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.

Table 7.3: Hypotheses for the satisfaction levels of living annuitants (continued)

	Independent variable	Hypothesis accepted	Null hypothesis (H0) & Alternative hypothesis (Ha)	Interpretation
15.	RISK AVERSION	Null	**H0[15]: There is no relationship between risk aversion and the satisfaction levels of living annuitants.** Ha[15]: There is a relationship between risk aversion and the satisfaction levels of living annuitants.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.
16.	INFLUENCE	Null	**H0[16]: There is no relationship between influence and the satisfaction levels of living annuitants.** Ha[16]: There is a relationship between influence and the satisfaction levels of living annuitants.	The p-value is non-significant ($p > .05$). The null hypothesis can therefore not be rejected.

Source: Author's conception.

From the 16 hypotheses, seven proved to be statistically significant. The seven factors that are associated with the satisfaction levels of living annuitants relating to their choice to self-annuitise, are discussed in Section 7.6. General AIP awareness and specific living annuity awareness are discussed under one heading.

7.6 FACTORS ASSOCIATED WITH SATISFACTION LEVELS OF LIVING ANNUITANTS

As seen in Table 7.3, the following factors significantly associated with living annuitants' satisfaction levels relating to their annuity choice: (i) post-retirement benefit perceptions of living annuity; (ii) fear of outliving retirement capital (inverse); (iii) financial literacy; (iv) awareness of AIPs in general, and awareness of living annuities specifically; (v) managing retirement capital (inverse); and (vi) low risk of dying[253] (inverse). These factors are discussed in detail below.

7.6.1 Post-retirement benefit perceptions

The post-retirement benefit perceptions of a living annuity exerted the strongest association with ($B = .556$) on respondents' satisfaction levels. There is a significant positive relationship ($p<.001$) between the post-retirement benefit perceptions of a living annuity and the satisfaction levels of living annuitants. Therefore, perceiving a living annuity as beneficial contributes positively to satisfaction levels in retirement.

[253] Mortality risk estimation

The post-retirement benefit perceptions of a living annuity were measured by asking respondents three questions. These questions measure whether living annuitants perceive the retirement income option they have chosen as beneficial. It follows logically that experiencing peace of mind, feeling a sense of financial security and believing that a fair return on investment[254] is achieved from one's AIP choice, positively associate with satisfaction levels.

7.6.2 Fear of outliving retirement capital

Fear of outliving retirement capital exerted the second strongest association with (B = -.313) on respondents' satisfaction levels. There is a significant negative relationship (p<.001) between the fear of outliving retirement capital and the satisfaction levels of living annuitants. Thus, the fear of outliving retirement capital reduces satisfaction levels.

Fear of outliving retirement capital was measured by asking respondents one question. In order to establish whether respondents were afraid of running out of capital during their lifetime, they were asked directly if they feared outliving their retirement capital. [255] Living annuitants are exposed to the risk of their capital becoming depleted whilst still alive, especially in the face of unsustainably high withdrawal rates and poor investment returns over a long period of time. This fear of outliving capital can be paralysing, as it may not be possible to recover from capital losses in old age. Also, annuitants may become victims of poor health later in life and may be incapable of earning an income to supplement their pension. In addition, a stable income stream may be particularly important late in life, as the need for medical care increases.

Of note, Panis (2004) ascribed the greater satisfaction experienced by life annuitants versus living annuitants over time to reduced anxiety about the risks of outliving retirement savings and ending up in poverty.

7.6.3 Financial literacy

Financial literacy exerted the third strongest association with (B = .208) on respondents' satisfaction levels. There is a significant positive relationship (p<.001) between financial literacy and the satisfaction levels of living annuitants. In other words, financial literacy contributes positively to satisfaction levels.

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[254] Post-retirement benefit perceptions (independent variable) refer to the broad question: "Do you perceive your chosen AIP as favourable?" The dependent variable measuring satisfaction levels refers to the broad question: "Are you happy with your chosen AIP?" If these two variables are correlated it means that if you perceive your annuity income product as beneficial, you may also be less likely to follow alternative income strategies in the future, experience regret about your current AIP choice, and may feel positive about your financial future. In making a distinction between post-retirement benefit perceptions and satisfaction levels, it is acknowledged that perceiving a certain option as beneficial may not necessarily be associated with satisfaction.

[255] If a person scores low on satisfaction levels during retirement (dependent variable), fear of outliving retirement capital (independent variable) pinpoints the aspect of a living annuity that can be attributed to this feeling of discontent.

Financial literacy was measured by asking respondents four questions. The first question (retirement-related) asked respondents whether investing in retirement funds versus non-retirement funds are treated equally from a tax perspective. Awareness of the tax implications of contributing to retirement funds as opposed to non-retirement funds, for example, illustrates to what extent a person is financially knowledgeable. Subsequently, being cognisant of the tax advantages offered by retirement funds, demonstrates pension literacy.

The second question (retirement-related) asked respondents whether retirement funds guarantee paying retirees a pension until death. Being wrongly under the impression that all retirement funds guarantee their members a pension until death would illustrate naivety and indifference on the respondent's part and would deem an investigation into the so-called annuity puzzle irrelevant.

The third question (investment-related) asked respondents whether it makes sense to invest in the shares of more than one company. This question tests respondents' understanding of the benefits of diversification.[256] Diversification is a widely-accepted principle on which sound investment is based.

The fourth question (retirement-related) asked respondents whether pension fund law prohibits retirement funds to invest in shares. This question tests respondents' insight into asset allocation regulations, as they apply to retirement funds specifically. Knowing that pension fund law does not prohibit retirement funds to invest in shares, illustrates financial literacy with respect to asset allocation regulations.

The importance of activities that could be regarded as an antecedent/precursor to financial literacy was echoed in the international literature. To this end, Panis (2004) showed that satisfaction levels were higher for individuals who had engaged in financial planning activities, as measured by having attended a retirement meeting and having access to a financial advisor. It therefore seems that people who understand the constraints and opportunities of pension fund investment and investment in general are more satisfied than those that do not.

7.6.4 Awareness of AIPs

Awareness of AIPs, are split into: (i) awareness regarding AIPs in general; and (ii) awareness of living annuities specifically. General awareness of AIPs exert the fourth strongest association with ($B = .171$) on respondents' satisfaction levels. There is a significant positive relationship ($p<.01$) between general AIP awareness and the satisfaction levels of living annuitants.

Correspondingly, awareness regarding living annuities specifically exert the sixth strongest association with ($B = .128$) on respondents' satisfaction levels. There is a significant positive relationship ($p<.01$) between living annuity product awareness, and the satisfaction levels of living

[256] Colloquially known as "not putting one's eggs in one basket".

annuitants. Thus, awareness about AIPs generally, as well as living annuity products specifically, increase satisfaction levels.

General AIP awareness was measured by asking respondents two questions. The first question asked respondents if they were adequately informed about retirement income options in general, and did not specifically refer to either a living and/or guaranteed annuity product. The second question established whether respondents had educated themselves on retirement income options on the whole. Also here, no mention was made of any specific AIPs.

Living annuity product awareness was measured by asking respondents one question. This question asked respondents if they are informed about and educated about a living annuity as a retirement income option. Awareness about AIPs captures a respondent's comprehension and clear understanding about what the various retirement income options entail.

It seems that individuals who are familiar with retirement income options, and actively educate themselves on the topic, are more likely to experience high satisfaction levels. This finding was confirmed by Panis (2004), who showed that individuals who engaged in financial planning activities (as measured by having attended a retirement meeting and having a financial advisor) reported higher satisfaction levels. Consequently, it seems that living annuitants, who are more actively engaged in annuity decision-making matters, are more content with their retirement annuity income stream. The factor of consumer awareness and education regarding AIPs could also be considered as an antecedent to financial literacy.

7.6.5 Managing retirement capital

Managing retirement capital exerted the fifth strongest association with (B = -.151) on respondents' satisfaction levels. Although one would expect that taking ownership and being actively involved in managing retirement capital would contribute to higher satisfaction levels among living annuitants, according to the multiple regression results, having the desire to control and manage living annuity capital in the pursuance of capital growth, actually reduced respondents' satisfaction levels. In fact, a significant negative relationship ($p<.01$) exists between having such decision-making power and the satisfaction levels of living annuitants. Therefore, the control and flexibility to grow retirement capital in a living annuity, diminish satisfaction levels.

Preference to manage retirement capital was measured by asking respondents two questions. The first question asked respondents whether they think they can do better by investing their retirement funds in a living annuity in order to generate investment growth. This question refers to the goal that living annuitants hope to achieve, i.e. growing their nest-egg during retirement. The second question asked respondents whether they like the flexibility and control of managing their capital in a living annuity. This question refers to respondents' inclination towards exercising their right to make decisions with respect to asset allocation, income drawdown rates, and investment managers, among others.

These two questions capture the essence of taking ownership and responsibility for one's own financial future, by taking advantage of the control and flexibility allowed within a living annuity product. In this way, living annuitants are able to design their own tailor-made portfolio of assets in the hope of earning a superior return on their investment. Consequently, living annuitants may feel the brunt of being directly exposed to poor investment choices, external investment shocks accompanied by unsustainably high withdrawal levels.

Respondents (living annuitants) who believe that they can earn a superior return on their investment by taking advantage of the control and flexibility allowed within a living annuity, experienced lower satisfaction levels during retirement. To the researcher's knowledge, the association of *managing retirement capital* on respondents' satisfaction levels as they relate to their chosen AIP, has not been scientifically researched before.

7.6.6 Mortality risk estimation

Mortality risk estimation exerted the seventh strongest association (B = .096) on respondents' satisfaction levels. A significant positive relationship ($p<.05$) exists between having low mortality risk and the satisfaction levels of living annuitants. Thus, having a low self-estimated risk of dying enhances satisfaction levels.

Mortality risk estimation was measured by asking respondents two questions. In both questions, respondents were asked about their subjective survival probability to age 85 and 90 plus, respectively. As expected, respondents who feel that they are likely to live until an advanced age, experienced more satisfaction. It is noted that people may worry about their retirement money not lasting for their lifetime, but they may even be more worried about dying early than they are about outliving their money. They do not see dying early as a solution to their challenges. Therefore if they think they still have long to live (lower mortality risk) they are happier. This could be explained by risk-order bias, where the likelihood of near events (dying soon) are easier imagined than far events (outliving retirement capital). This factor was not directly tested by Panis (2004), Bender and Jivan (2005), nor by Nyce and Quade (2012).

7.7 STATISTICALLY NON-SIGNIFICANT VARIABLES

The following variables did not significantly associate with respondents' satisfaction levels:

i) **Speed of financial decision-making:** This factor was not investigated by Panis (2004); Bender and Jivan (2005), nor by Nyce and Quade (2012).

ii) **Risk aversion:** The insignificance of this factor is in contrast to the finding Panis (2004) that high risk aversion positively associates with satisfaction levels.

iii) **Bequest motive:** This factor was not investigated by Panis (2004), Bender and Jivan (2005) nor by Nyce and Quade (2012). The percentage of respondents who are married and who had chosen a living annuity, a guaranteed annuity, and a combination of both were 80.80%, 58% and 79% respectively. This finding could potentially point towards the existence of family risk-sharing strategies among couples. Also, the average number of children/grandchildren (and financial dependants) of respondents who had chosen a living annuity, a guaranteed annuity, and a combination of both were 5.91 (1.31); 6.50 (1) and 5.31 (1.56) respectively. These results confirm the inadequacy of using children/grandchildren, as well as financial dependants, as a proxy to measure the bequest motive.

iv) **Access to retirement capital:** This factor was not investigated by Panis (2004), Bender and Jivan (2005), nor by Nyce and Quade (2012).

v) **Access to capital:** This factor was not investigated by Panis (2004), Bender and Jivan (2005), nor by Nyce and Quade (2012).

vi) **Trust in advisor:** This factor was not investigated by Panis (2004), Bender and Jivan (2005), nor by Nyce and Quade (2012).

vii) **Mortality salience:** This factor was not investigated by Panis (2004), Bender and Jivan (2005), nor by Nyce and Quade (2012).

viii) **General patience:** This factor was not investigated by Panis (2004), Bender and Jivan (2005), nor by Nyce and Quade (2012).

ix) **Influence:** This factor was not investigated by Panis (2004), Bender and Jivan (2005), nor by Nyce and Quade (2012).

7.8 SUMMARY OF THE FACTORS ASSOCIATED WITH SATISFACTION LEVELS OF LIVING ANNUITANTS

It is evident from the regression analysis, that the two most significant factors that positively associate with respondents' satisfaction levels are the perception that living annuities are beneficial as well as the level of financial literacy of living annuitants. In contrast, the factor which has the most severe negative impact on living annuitants' satisfaction levels is the fear of outliving retirement capital.

Having control and flexibility over retirement capital growth, significantly decreases the satisfaction levels of respondents. It may have seemed like a good idea at the time and the respondent may have sought control because they thought they would enjoy it, but in the end it turned out to be a cumbersome burden and a worry. Moreover, awareness of AIPs (in general, and living annuities specifically) is an important factor that is positively associated with respondents' satisfaction levels. Finally, respondents with a self-estimated low risk of dying, are more satisfied.

7.9 SATISFACTION LEVELS OF LIVING ANNUITANTS ACCORDING TO DEMOGRAPHIC GROUP

Differences in satisfaction levels of living annuitants in various demographic groups were identified. A comparison of responses for demographic independent variables among annuitants who chose a living, guaranteed and blended strategy respectively, are given in Table F.6 (See Appendix F). The following differences between living annuitant satisfaction levels[257] in various demographic groups were assessed by using SPSS:

i) **Marital status.** An independent samples t-test was used to compare the means of respondents who are married (Group 1) to those who are not (Group 2), in order to determine whether there is statistical evidence that the satisfaction levels of the two groups differ. The independent variable therefore consists of two groups measured as binary categorical data.

ii) **Age.** The Pearson correlation coefficient was used to measure the strength of the relationship between age and satisfaction levels. The independent variable is measured as continuous data.

iii) **Medical scheme.** An independent samples t-test was used to compare the means of respondents who belong to a medical scheme (Group 1) to those who do not (Group 2), in order to determine whether there is statistical evidence that the satisfaction levels of the two groups differ. The independent variable therefore consists of two groups measured as binary categorical data.

iv) **Health insurance.** An independent samples t-test was used to compare the means of respondents who have health insurance (Group 1) to those who do not (Group 2), in order to determine whether there is statistical evidence that the satisfaction levels of the two groups differ. The independent variable therefore consists of two groups measured as binary categorical data.

v) **Health status.** The one-way ANOVA was used to determine whether there are any statistically significant differences between the means of respondents who reported to be in excellent health (Group 1), very good health (Group 2), good health (Group 3) and poor health (Group 4). The independent variable is therefore categorical and consists of four groups.

vi) **Income status.** An independent samples t-test was used to compare the means of respondents in lower income brackets (Group 1) to those in higher income brackets (Group 2) in order to determine whether there is statistical evidence that the satisfaction levels of these groups differ. The independent variable therefore consists of two groups measured as binary categorical data.

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[257] Satisfaction levels were measured linked to a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree).

In the first column in Table 7.4 the independent variables are listed, followed in the second column by the hypotheses that were tested. In the third column the statistical techniques employed in SPSS are identified. Next, in columns 4 and 5, the results as produced by SPSS and a short interpretation are given respectively. No assumptions on which bivariate analyses rest were violated in a way that would invalidate results.

Table 7.4: Hypotheses[258] for the satisfaction levels of living annuitants (demographic)

	Independent variable	Null hypothesis (H0) & alternative hypothesis (Ha)	Statistical test	Results	Interpretation
1.	MARITAL STATUS	**H0[1]: The mean for Group 1 (married) is equal to the mean for Group 2 (unmarried).** H1[1]: The mean for Group 1 (married) is not equal to the mean for Group 2 (unmarried).	Independent samples t-test Categories are collapsed into two groups (married versus not married), in order to address the skewness[259] of the data.	The Sig. for Levene's test for equality of variances is larger than .05 (p = .652), therefore equal variances are assumed with an F-value of .204. (For detail SPSS results, see Appendix F, Table F.7 and Table F.8.)	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.
2.	AGE	**H0[2]: There is no relationship between age and satisfaction.** Ha[2]: There is a relationship between age and satisfaction.	Pearson correlation	Pearson correlation is -.051 (p = .444) (For detail SPSS results, see Appendix F, Table F.9 and Table F.10)	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.

[258] In all cases the null hypothesis was addressed.

[259] The extent to which the distribution varies from a normal distribution.

Table 7.4: Hypotheses for the satisfaction levels of living annuitants (demographic) (continued)

	Independent variable	Null hypothesis (H0) & alternative hypothesis (Ha)	Statistical test	Results	Interpretation
3.	HEALTH STATUS	$H0^3$: The mean satisfaction for Group 1 (excellent) = the mean satisfaction for Group 2 (very good) = the mean satisfaction for Group 3 (good) = mean satisfaction for Group 4 (poor). **$H1^3$: The mean for Group 1 (excellent) ≠ the mean for Group 2 (very good) ≠ the mean for Group 3 (good) ≠ the mean for Group 4 (fair).**	One-way ANOVA (Data within the four groups is near evenly distributed.)	The F-value is 7.392 (p = .000). Post-hoc Scheffe test: Satisfaction is significantly different for those in excellent versus good/fair health and for those in very good versus good/fair health. (For detail SPSS results, see Appendix F, Table F.11, Table F.12, Table F.13)	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, those with better health report higher levels of satisfaction than those with poorer health.
4.	INCOME STATUS	$H0^4$: The mean for Group 1 (lower) = the mean for Group 2 (higher). **$H1^4$: The mean for Group 1 (lower) ≠ the mean for Group 2 (higher).**	Independent samples t-test (Categories are collapsed into two groups (lower income versus higher income, in order to address the skewness of the data.)	The Sig. for Levene's test for equality of variances is larger than .05 (p = .106), therefore equal variances are assumed with an F-value of 2.634. (For detail SPSS results, see Appendix F, Table F.14 and Table F.15.)	The p-value is significant at the .1% confidence level (p = .000). The null hypothesis must therefore be rejected. Deductively, individuals in higher income brackets report higher satisfaction levels than those in lower income brackets.
5.	MEDICAL SCHEME	**$H0^5$: The mean for Group 1 (medical scheme) = the mean for Group 2 (no medical scheme).** $H1^5$: The mean of Group 1 (medical scheme) ≠ the mean of Group 2 (no medical scheme).	Independent samples t-test (Despite skewness of data.)	The Sig. for Levene's test for equality of variances is larger than .05 (p = .124), therefore equal variances are assumed with an F-value of 2.384. (For detail SPSS results, see Appendix F, Table F.16 and Table F.17.)	The p-value is non-significant (p > .05). The null hypothesis can therefore not be rejected.

Table 7.4: Hypotheses for the satisfaction levels of living annuitants (demographic) (continued)

	Independent variable	Null hypothesis (H0) & alternative hypothesis (Ha)	Statistical test	Results	Interpretation
6.	HEALTH INSURANCE	H0[6]: The mean for Group 1 (health insurance) = the mean for Group 2 (no health insurance). **H1[6]: The mean of Group 1 (health insurance) ≠ the mean of Group 2 (no health insurance).**	Independent samples t-test	The Sig. for Levene's test for equality of variances is smaller than .05 (p = .040), therefore equal variances are not assumed. (For detail SPSS results, see Appendix F, Table F.18 and Table F.19.)	The p-value is significant at the 5% confidence level (p = .020). The null hypothesis must therefore be rejected. Deductively, individuals with health insurance report higher satisfaction levels than those who do not.

Source: Author's conception.

7.10 DEMOGRAPHIC VARIABLES THAT ACCOUNT FOR DIFFERENCES IN SATISTACTION LEVELS

As seen in Appendix F, health status, health insurance and income status are the only demographic independent variables that account for differences in the dependent variable, satisfaction, as discussed below.

7.10.1 Health status

As also confirmed by Panis (2004), Bender and Jivan (2005) and Nyce and Quade (2012), respondents who report to enjoy good health in retirement are more satisfied compared with those who suffer from poorer health. It is not surprising that good health is positively associated with retirees' physical and psychological wellbeing.

7.10.2 Health insurance

Health insurance is a significant demographic factor that accounts for differences in satisfaction levels, which is in line with the findings of Panis (2004), who found that individuals with health cover have higher satisfaction levels compared with individuals who do not.

7.10.3 Income status

Income status is a significant demographic factor that accounts for differences in satisfaction levels. This is in line with the findings of Panis (2004), Bender and Jivan (2005) and Nyce and Quade (2012), who found that high income individuals have higher satisfaction levels compared with low income individuals.

7.11 STATISTICALLY NON-SIGNIFICANT DEMOGRAPHIC VARIABLES

The following demographic variables did not significantly account for differences in respondents' satisfaction levels.

7.11.1 Marital status

Marital status is not a significant demographic factor that accounts for differences in satisfaction levels. Of the respondents that self-annuitise, 84.7 percent were males, and 15.3 percent were female. It could be argued that, if in most cases the husband handles the finances, the increased satisfaction derived from the companionship of marriage may be offset by the financial stress/worry of making sure the other spouse is taken care of for the rest of her life. This is in contrast to the findings of Panis (2004), Bender and Jivan (2005) and Nyce and Quade (2012), who found that married individuals have higher satisfaction levels compared with unmarried individuals.

7.11.2 Age

Age is not a significant demographic factor that accounts for differences in satisfaction levels. This is in contrast to the findings of Panis (2004) who found that older individuals report higher satisfaction levels compared with those who are younger.

7.11.3 Medical scheme membership

Medical scheme membership is not a significant demographic factor that accounts for differences in satisfaction levels. This is in contrast to the findings of Panis (2004), who found that retirees with health cover have higher satisfaction levels compared with individuals who do not.

7.11.4 Summary of the demographic factors that accounted for differences in satisfaction levels

According to the statistical analyses performed to assess the demographic independent variables, the results show that retirees in good health report higher satisfaction levels. Also, a higher income status, as well as having a health insurance policy in place, significantly account for higher satisfaction in retirement. These findings are in accordance with the international literature (e.g. Panis, 2004).

7.12 TEST FOR ROBUSTNESS

If results are robust, they will hold and deliver similar results under a variety of conditions, even if the assumptions are altered or violated. To test for robustness, the analysis in Section 7.4 was repeated by including all independent variables and demographic variables into one multiple regression. The addition of the demographic variables did not change the main findings, conclusions and implications of the study.

7.13 CHAPTER SUMMARY

In this analysis, the factors that are associated with the satisfaction levels of living annuitants as they relate to the eventual outcome of their AIP choice were identified. It is evident from the regression analysis, that one of the most significant factors that positively relates to respondents' satisfaction levels, is financial literacy. Understandably, the fear of outliving retirement capital has a severe negative impact on living annuitants' satisfaction levels. Also, as predicted, living annuitants who perceive living annuities as beneficial, are more content.

Having control and flexibility over retirement capital growth, significantly decreases the satisfaction levels of respondents. It may have seemed like a good idea at the time and the respondent may have sought control because they thought they would enjoy it, but in the end, it turned out to be a stressful responsibility. Moreover, awareness of AIPs (in general, and living annuities specifically) is an important factor positively associated with respondents' satisfaction levels. Finally, respondents with a self-estimated low risk of dying, are more satisfied.

According to the statistical analyses performed to assess the demographic independent variables, the results show that health contributes significantly to satisfaction. Also, a higher income status, as well as having a health insurance policy in place, significantly account for higher satisfaction in retirement. These findings are in accordance with the international literature (e.g. Panis, 2004).

The following chapter interprets the empirical results and offers conclusions for this study.

CHAPTER 8:
CONCLUSIONS

Awareness is the greatest agent for change – Eckhart Tolle (2020).

8.1 INTRODUCTION

Despite the substantial body of scholarly literature that attempts to explain the reticence among retirees to insure themselves against arguably the biggest risk they face in retirement, namely longevity risk, there appears to be little empirical evidence to guide our understanding of how individuals make AIP choices. In a world plagued by uncertainty caused by, *inter alia*, political polarisation/divisiveness, economic instability, pandemics, and climate change, one would expect a higher demand for an AIP that guarantees a consistent annuity income stream for the duration of retirement (however long it may be). This applies even more to retirees, who find themselves in a vulnerable life stage, where they may have neither the time, nor the future income earning capacity to recover from possible financial devastation. It therefore seems meaningful to investigate the forces that relate to people's annuity perceptions and resulting intention to annuitise, as well as the specific annuity attributes or consumer characteristics and other factors that are associated with satisfaction levels in retirement, as it may place us in a better position to guide individuals in choosing an optimal AIP.

In Part 1 of this study, as a first step into the investigation of the factors that relate to individuals' perceptions regarding AIPs and their subsequent intention to choose either a guaranteed annuity or a living annuity, a questionnaire grounded in annuity puzzle theory was designed and distributed to two sub-samples, as follows: (i) employees of Stellenbosch University (SU) who are members of the University of Stellenbosch Retirement Fund (USRF); and (ii) Exxaro employees who are members of the Exxaro Retirement Funds.

The subsequent Part 2 contained an exploration of the various living annuity attributes and other factors that are associated with living annuitants' satisfaction levels, to which end a second questionnaire was distributed to pensioners consisting of two sub-samples, namely: (i) former employees of SU, who are fully retired from the USRF; and (ii) Glacier annuity clients, who receive either living or guaranteed annuity income, or a combination of both living and guaranteed annuity income.

8.2 FACTORS THAT RELATE TO ANNUITY DECISION-MAKING

In order to process the primary data obtained from the questionnaires, various statistical analyses available in SPSS were performed. The factors that relate to annuity decision-making as graphically illustrated in Figure 8.1, were subsequently developed based on these results. The factors that relate to annuity decision-making consist of three components, namely: Part 1A&B: factors that significantly contribute to the benefit perceptions of living and guaranteed annuities respectively; Part 1C: factors that predict an individual's intention to choose a guaranteed annuity; and Part 2: factors that can be associated with increased or decreased levels of satisfaction in retirement. The arrows in Figure 8.1 do not imply a directional causal relationship between benefit perceptions, intention and satisfaction, but shows the logical flow of this study.

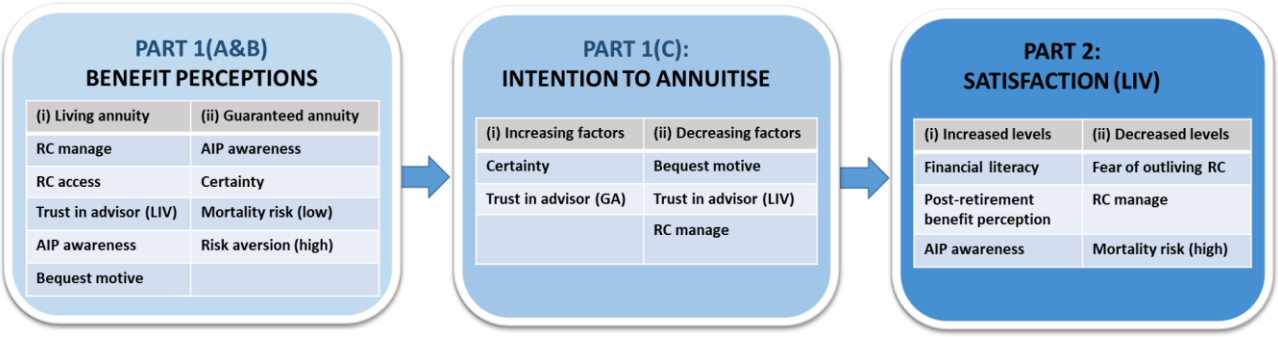

Figure 8.1: Annuity decision-making factors

More specifically:

Part 1 (A&B): Based on performing multiple regression analyses in SPSS, the conclusions with respect to **benefit perceptions** are:

(i) *Living annuity* desirability is significantly related to: (a) the flexibility and control of managing the underlying capital in a living annuity in the pursuance of capital growth; (b) the ability to access underlying funds in a living annuity to pay for unforeseen expenses; (c) trust in the integrity of financial advisors selling living annuities; (d) awareness about AIPs; (e) the bequest motive, according to which the remaining capital within a living annuity can be bequeathed to the annuitant's heirs.

(ii) *Guaranteed annuity* desirability is significantly related to: (a) awareness about AIPs; (b) the certainty of annuity income payments without any further involvement from the annuitant; (c) mortality risk (low); (d) risk aversion (high).

Part 1 (C): By performing a logistic regression analysis in SPSS, the following factors were found to relate to the **intention to annuitise**:

(i) *Increasing factors*, namely: (a) the certainty of annuity income payments without any further involvement from the annuitant; and (b) trust in the integrity of financial advisors selling guaranteed annuities.

(ii) *Decreasing factors*, namely: (a) the bequest motive; (b) the trustworthiness/integrity of advisors selling living annuities; and (c) the perceived superiority of income from a living annuity as achieved by managing the growth of your own retirement capital.

Part 2: By performing a multiple regression analysis in SPSS, the following factors were found to contribute to **annuity satisfaction levels** among living annuitants:

(i) *Increased levels*: (a) financial literacy; (b) the perceived benefit of living annuities (as measured by peace of mind, financial security and return on investment); (c) awareness about AIPs.

(ii) *Decreased levels*: (a) the fear of outliving capital; (b) managing retirement capital in retirement; (c) mortality risk, as measured by a living annuitant's estimation regarding his/her life expectancy.

8.3 FINDINGS ON ANNUITY DECISION-MAKING FACTORS

From the results of the empirical analyses undertaken and reported in Chapter 6 and Chapter 7 there are some factors that proved to be significant in the annuity decision-making process, as illustrated in Figure 8.1. A discussion of how some of these annuity decision-making factors (see Figure 8.1) interrelate, follows.

8.3.1 Pre-retirement: Managing retirement capital[260]

People who think they can withdraw an above-average income in retirement, by generating superior investment returns on the underlying investments in a living annuity, have confidence in their own investment skills and/or the investment skills of financial advisors.

Investor confidence has to do with belief in an individual's ability to earn a higher income by investing retirement capital him/herself (mostly with the help of a financial advisor) and significantly relates to individuals' positive attitude towards self-annuitisation. According to existing literature, investor confidence plays an important role in the annuity puzzle, since some retirees feel more competent than insurers in managing their retirement capital. This belief of "doing better" with a living annuity (as opposed to a guaranteed annuity) can be attributed to the following:

- Living annuitants have *control* over their retirement capital and can invest in a variety of asset classes, for example equities, with the prospect of earning superior rates of return. In comparison, in order to cover their liabilities towards life annuitants, life insurers are limited in terms of investable asset classes. Life annuitants are thus forced to invest implicitly in the assets that insurers use to back their promise – usually in low-yielding, long-term bonds.

[260] On 10 October 2019, during a meeting with Gideon van Zyl (Simeka, Sanlam) who has over 30 years' experience as principal officer and trustee of various retirement funds in South Africa and abroad, he correctly predicted to the researcher several respective factors identified in this chapter that influence annuity decision-making. In particular, he foresaw the finding of this thesis that flexibility within a living annuity to pursue investment returns often contributes to individuals' favourable perception and preference to self-annuitise.

Subsequently, if the underlying investment portfolio generates a good return, living annuitants can withdraw annuity income in excess of what a guaranteed annuity could provide.

- Also, a living annuity allows the annuitant the *flexibility* to withdraw income, within prescribed annual limits of between 2.5% and 17.5% of the market value of the investment portfolio. The annuitant may elect a different income drawdown rate that will be applied to the revised fund value at the anniversary date of the annuity contract, provided it is within the set limits.
- Investors may base their annuity decision on the specific frame that is used in presenting their retirement income options. Many retirees adopt an investment frame, as the way in which their options are presented focus on the return and risk features of an AIP, without considering the consequences for consumption. The attractive feature of self-annuitising under the investment frame is the possibility of generating superior investment returns (whereas the unattractive feature of self-annuitisation under the consumption frame is the possibility of outliving retirement capital). The unattractive feature of annuitisation in the investment frame will be the potential to lose money in the event of premature death (However, under the consumption frame, annuitisation is attractive, as it serves as a form of insurance for consumption throughout retirement). This study supports the presence of the framing effect, since formulating living annuity characteristics through the investment frame could have a positive effect on its benefit perception and desirability.

Based on the evidence that investor confidence relates to the desirability of living annuities, awareness regarding the following issues should be raised in guiding retirees in their annuity decision-making:

- Although equities have historically consistently outperformed other asset classes, it may underperform over shorter time horizons. If living annuitants should withdraw income from their investment portfolio during such times, especially at rates that exceed the growth rate generated by the underlying investment portfolio, they run the risk of capital depletion. This could occur at a time when the retiree no longer has the benefit of time to recover from such losses, and may not have other sources of income. Retirees should exercise extreme caution if their main reason to self-annuitise is to earn superior investment returns, as the risk of capital depletion may significantly outweigh the possibility of generating superior investment returns.
- It is an established fact that equities in a well-constructed portfolio are justified if the investment horizon is sufficiently long. As an alternative to self-annuitisation, in order to sustain oneself throughout retirement, guaranteed annuities could provide a consistent income stream for however long the retiree lives, and protect the annuitant against investment risk.

- Being aware of the cognitive biases that guide our investment decisions, holistic thinking requires retirees to view the annuity decision through both the investment and consumption frames. The attractive feature of self-annuitising under the investment frame is the possibility of generating superior investment returns, whereas the unattractive feature of self-annuitisation under the consumption frame is the possibility of outliving retirement capital. Guaranteed annuities are specifically designed to eliminate this risk. The unattractive feature of annuitisation in the investment frame will be the potential to lose money in the event of premature death (This negative consequence could be counter-acted by having *life insurance* in place.) Under the consumption frame, however, annuitisation is attractive, as it serves as a form of insurance for consumption throughout retirement.

8.3.2 Post-retirement: The management of capital in retirement

For the researcher, the most unexpected finding in this study, was that the desirability for flexibility and control over retirement capital to pursue capital growth, significantly contributed to discontentment. Paradoxically, the attributes that initially positively related to the benefit perceptions of self-annuitisation, can often be associated with dissatisfaction in retirement.

In other words, respondents pre-retirement with *investor confidence* and a desire for *flexibility/control* and *accessibility* find self-annuitisation beneficial. However, when respondents were asked about the responsibilities that come with self-annuitisation in their retirement, these factors that were desirable before retirement, became a burden.

Deductively, this finding challenges the generally-accepted belief in Western culture that more control, choices, flexibility and autonomy lead to a better outcome or an improvement in wellbeing, in the following ways:

- The *flexibility* and *control* of managing a living annuity and earning an above-average return, ultimately shift the responsibility and burden of not making suboptimal decisions to the annuitant, whereas a guaranteed annuity runs automatically and requires no further decision-making, once the initial irreversible decision of exchanging a capital lump sum for a consistent income stream of payments has been made.
- All the decision-making required in a living annuity contract may debilitate rather than liberate, as the annuitant is expected to continually make decisions in retirement that involve problematic trade-offs. This could be especially difficult in old age or if the spouse who handled the finances dies.

In summary, legislative interventions imposed by government to reform the retirement income industry, by introducing default options, imposing constraints/limits with respect to withdrawal rates, underlying investments and advisor fees, may not only benefit retirees, but also society as a whole, as the promise of retirement income security for a vulnerable group of our society is restored.

8.3.3 The bequest motive

The bequest motive, which refers to the annuitant's desire to leave remaining retirement capital to heirs at death, significantly related to individuals' positive attitude towards self-annuitisation. If a bequest motive is indeed present, it is important to establish whether the end justifies the means. In other words, the retiree must establish the validity and legitimacy of the underlying reasons that drive the bequest motive, otherwise it may direct the annuitant's choice unjustly. The bequest motive is mainly driven by three underlying forces, namely: (i) altruism; (ii) egoism; and (iii) family risk-sharing strategies.

8.3.3.1 Altruism

If the bequest motive is driven by an altruistic desire to leave something of value behind to surviving family members at death, the uncertain nature of this potential bequest should be given due consideration, as no one knows for sure what the amount of the bequest will be or when it will occur. The eventual size of the bequest could also potentially have a negative value, in the event of capital depletion before death, in which case family members may instead "inherit" the financial obligation to provide for the retiree (in the absence of state support, which is negligible in the South African context). It could also be argued that relieving one's family of the financial burden of support is an altruistic gesture in and of itself.

A guaranteed annuity exempts the retiree's family members of the financial risk and subsequent burden of providing for the retiree at some future date. It should be kept in mind that family members may not even have taken the necessary precautions in their financial planning to provide for the retiree, or it may simply not be within their means to do so.

There exists a myriad of alternative bequests to leave to family members: for example, donations whilst the annuitant is still alive, or a life insurance policy on the annuitant's life and ceded to the prospective heir/family member. However, should the annuitant no longer be insurable, due to either old age and/or poor health status, an accidental life policy could be effected, which requires no medical underwriting. Such pre-determined insured amount will pay out if the annuitant dies from unnatural causes, e.g. a car accident. Other investment products or physical assets could also be identified as bequeathable assets and could be included in the annuitant's will to be inherited by specifically nominated beneficiaries.

8.3.3.2 Egoism

Various scholars who investigated the phenomenon of a bequest motive in the absence of children, encountered, for example, the so-called egotistical bequest motive, according to which annuitants wish to die with a positive net value. Having the desire to keep retirement capital intact in anticipation of death or finding it hard to part with retirement capital in anticipation of death (as explained by the

endowment effect)[261] could cause a retiree to view guaranteed annuities as a risky gamble where potential losses loom larger than potential gains. Creating awareness of such potential cognitive bias, and understanding the tried and tested mechanisms underlying a formal guaranteed annuity market, could result in more rational and deliberate annuity decision-making. The utility derived from dying with a positive net value is only justified if the entire estate is bequeathed to specified individuals and/or institutions.

8.3.3.3 Family risk-sharing strategies

The third possible driving force behind the bequest motive is risk-sharing strategies within families. Potential heirs might be willing to fund the retiree should he/she run out of capital during his/her lifetime, in exchange for inheriting any money left over in the annuitant's living annuity. Such a strategy requires neither altruistic nor egotistical motivations.

One should be aware of the following pitfalls: (i) In the absence of a valid contract, it may be impossible to keep parties accountable to keep their end of the bargain, especially if an informal verbal agreement was formed. This may lead to conflict within the family structure, which may be difficult to salvage. (ii) The potential heir might find this strategy especially challenging if the annuitant lives very long, during which time the underlying capital in the annuitant's living annuity achieves poor returns, and excessive withdrawals are made. (iii) The potential heir may come into financial trouble and may therefore be unable to pay the retiree an annuity income, which could have detrimental consequences.

Where there is risk-sharing in the setting of a marriage, spouses normally agree to pool their resources, and to name each other as the major or sole beneficiary in their respective wills. The efficacy of this strategy depends on: (i) one of the partners dying well before the other, as for each partner the risk of living too long is partially hedged by the other partner's potential earlier death; and (ii) a lasting partnership.

Financial advisors and benefit counsellors should assist their clients in examining whether the validity of their bequest motive outweighs the risk of outliving capital.

8.3.4 Fear of outliving retirement capital

The fear of outliving retirement capital substantially contributed to annuitants' dissatisfaction in retirement. It is an established fact that living annuitants run the risk of outliving their retirement capital. The chance of such an undesirable scenario occurring increases in the wake of poor investment returns and excessive withdrawal rates. Furthermore, having the option to access retirement capital and withdraw large capital lump sums may tempt retirees to use such capital unwisely. A strong sense of discipline is required to honour the ultimate goal of providing the

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[261] The endowment effect, which stems from prospect theory's loss aversion (Tversky & Kahneman, 1981) refers to the overvaluation of current possessions (Thaler, 1980).

annuitant with an annuity income stream for life. The freedom of selecting investments and deciding on withdrawal rates therefore comes with much responsibility.

Despite the risk of outliving retirement capital, most people choose to self-annuitise. Two of the factors explaining this phenomenon are: (i) people overestimating their sense of self-discipline; and (ii) individuals' inability to visualise themselves in old age with insufficient funds, especially if they are still in the prime of their lives – young, healthy, and earning a substantial income.

In behavioural finance, Tversky and Kahneman's (1974) theory of risk-order bias supports the notion that individuals underrate the probability of far-off periods, in contrast to near periods, which are more easily imagined and therefore carry a greater likelihood of occurring. As a result, the probability of poverty in old age is gravely underestimated.[262] Individuals who have yet to make an annuity decision, should be made aware of the fear living annuitants have to endure during their retirement years, as the reality of outliving retirement capital becomes more probable. This fear may be exacerbated in cases where living annuitants become too sickly or old to manage their finances, and especially also if the spouse who managed the finances, dies first.

8.3.5 The role of the financial advisor/benefit counsellor

Having trust in the integrity of financial advisors significantly related to individuals' annuity perceptions and intent. In the same way, AIP awareness and financial literacy not only relate to individuals' outlook on annuities, but also their eventual satisfaction in retirement. Financial advisors and benefit counsellors have a duty of care to inform and educate their clients on their imminent annuity decision, with respect to particularly the following matters: (i) longevity risk and longevity pooling; and (ii) cognitive biases.

8.3.5.1 Longevity risk and longevity pooling

Awareness of and education in guaranteed annuities, significantly relate to their benefit perceptions. Perceiving a guaranteed annuity contract as fair and equitable, depends largely on the annuitant's understanding of two basic concepts, namely: (i) longevity risk; and (ii) longevity pooling. Longevity risk refers to the risk of outliving capital, whereas longevity pooling refers to insurance companies pooling retirees' money, with the view to using the payments from those who die early to subsidise those who live long. Annuitants therefore forfeit their retirement capital to the life insurer when they annuitise in order to obtain the certainty of a guaranteed income stream for life.

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[262] In a private discussion on 31 January 2019 with the internationally-renowned expert on annuity decision-making, Moshe Milevsky (Milevsky, 2013), he compared individuals' reluctance towards financially planning ahead for retirement with the worrying issue of neglecting the fight against climate change.

Moshe is also on record to have been criticised on an online platform by the investment world (on the grounds that he could do better with his money) for his own personal choice of having bought a deferred annuity, i.e., a contract with an insurance company that promises to pay the holder a guaranteed annuity income stream at some future date (This product is not available in the South African market).

As retirees may find it too risky to annuitise should they die unexpectedly early, especially from an investment frame perspective, the remedial solution could be to effect a life insurance policy on the retiree's life, as a safety-net. Many DC retirement fund members are not aware of this aspect, and are often not reminded by either their human resource departments or financial advisors, at resignation, retrenchment or retirement, that they may have the option to convert group life cover into an individual life policy, without further stringent medical underwriting.

8.3.5.2 Cognitive biases

Financial advisors and benefit counsellors have a joint responsibility and important role to play in helping clients objectively consider their annuity decision and to think rationally about their alternative options. To this end, the financial advisor/benefit counsellor could assist clients by creating an *awareness* of the cognitive biases that shape annuity choices. Such awareness may place them in a better position to make an informed and rational choice. These cognitive biases include, but are not limited to, the aspects of framing, risk-order bias and the endowment effect.

The financial advisor or benefit counsellor could also play a significant role in reminding his/her clients that the primary goal of their retirement capital is to convert it into a sustainable income stream, in order to financially sustain themselves throughout retirement, and to thereby avoid dependence on the state or family members.

Making clients aware of their potential cognitive biases in making annuity decisions, may lead to higher *financial literacy* and possibly satisfaction, as is suggested by the evidence in this study. Financially literate retirees who are aware of the pitfalls in annuity decision-making, will be able to make optimal decisions that are in their best interest over the long run, with the desirable outcome of a fulfilling and secure retirement.

8.4 FINAL COMMENTS

The principal focus of this study is an investigation into the multi-faceted factors that relate to annuity decision-making, with the view to assist individuals in their choice of an appropriate retirement income strategy leading to financial wellbeing.

The main conclusions from this study are:

i) The underlying motives and awareness of various cognitive biases for choosing any particular AIP should be extensively examined. The bequest motive, which refers to the desire to leave retirement capital to heirs, often results in an unjustified belief in living annuity desirability, with the possible negative outcome of outliving retirement capital and facing poverty in retirement, the result of which could lead to dependency on the state or family members for financial support. Also, bias towards self-annuitisation before retirement is mainly related to investor confidence in earning an above-average income based on the capital growth generated by the underlying capital, although the accompanying issues with respect to managing these investments often prove problematic.

ii) The guarantee of receiving a consistent annuity income stream after retirement, as provided by the guaranteed annuity option, is often disproportionately negated by the desire, prevalent in the living annuity option, to have control over underlying capital. A substantial impact on individuals' perception and intention to annuitise, is the assurance of a predictable and consistent annuity income stream, without continuous involvement in investment decision-making.

iii) Trust in the integrity of financial advisors significantly relates to individuals' annuity perceptions and intent.

The next chapter discusses the implications and limitations of these findings and offers recommendations for future research.

CHAPTER 9:
IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

9.1 INTRODUCTION

Although the guaranteed income stream of payments provided by guaranteed annuities in most cases seems to be the appropriate way to eliminate longevity risk, it is an established fact that only a small percentage of individuals actually purchase them. This world-wide phenomenon has been dubbed the annuity puzzle, which seems to apply especially in the South African context, where adverse economic implications often result from self-annuitants outliving their retirement capital.

This study shed light on the intriguing annuity puzzle, by identifying the factors that relate to annuity decision-making[263] in the contexts of annuity perception, intention and satisfaction. Based on the identification of annuity decision-making factors, an instrument/tool was developed for possible application by financial advisors/benefit counsellors in their guiding of clients with respect to their choice of an optimal AIP (See Appendix G and Appendix H).

This study may be regarded as a contribution, on both theoretical and managerial levels, to annuitant decision-making. Whereas Section 9.2 presents theoretical implications of the study, Section 9.3 focuses on its significance with respect to managerial policy-making. Finally, Section 9.4 lists some limitations of this study, and offers recommendations for future research.

9.2 THEORETICAL IMPLICATIONS

Contrary to the recommendations based on economic theory, very few people avail themselves of the benefits that guaranteed annuitisation provides. Scholars have been grappling with this issue for several decades, which has resulted in a substantial body of literature that seeks to resolve the puzzling phenomenon of why so few retirees annuitise their retirement capital in a guaranteed manner. Most of these existing research studies are conducted in the setting of the standard life-cycle model of utility maximisation, in some cases also accompanied by conclusions based on empirical observations.

The novel aspect of this study is a thorough investigation into (i) the factors that relate to living and guaranteed annuity benefit perceptions pre-retirement; and (ii) the phenomenon of annuitants deciding against the route of a guaranteed income stream after retirement, specifically also as they relate to satisfaction levels. This study contributes to the existing annuity puzzle literature, by attempting to deepen the understanding of how people actually make annuity decisions.

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[263] See Figure 8.1.

As most of the existing research studies on annuity decision-making have been conducted in the context of first world countries, this work can also be seen as contributing to the debate on annuity decision-making in the context of a developing country, with specific reference to South Africa. This study shows that there are indeed similarities between the factors that relate to annuity decision-making in both developed and developing countries, like South Africa.

The identified factors that relate to annuity perception, intention and satisfaction, as illustrated in Figure 8.1, serve as the basis on which this study makes a theoretical contribution to the financial planning subject field. The scientific findings of this study emphasise the need for a collective effort and cooperation from all stakeholders involved in the annuity decision-making process to enable and facilitate appropriate AIP selection, with the end goal of securing the financial wellbeing of retirees.

Insight into the following matters prove essential:

i) **Education and awareness about the underlying forces/motives, as well as cognitive biases present in favouring any particular AIP**. The bequest motive, which refers to the desire to leave retirement capital to heirs, often results in an unjustified belief in living annuity desirability, with the possible negative outcome of outliving retirement capital and facing poverty in retirement, the result of which could lead to dependency on the state or family members for financial support. Furthermore, bias towards self-annuitisation before retirement is mainly related to investor confidence in earning an above-average income based on the capital growth generated by the underlying capital, although the accompanying issues with respect to managing these investments often prove problematic.

ii) **The rational evaluation of AIP suitability, without unwarranted prejudice.** The guarantee of receiving a consistent annuity income stream after retirement, as provided by the guaranteed annuity option, is often disproportionately negated by the desire, prevalent in the living annuity option, to have control over underlying capital.

A substantial impact on individuals' perception and intention to annuitise, is the assurance of a predictable and consistent annuity income stream, without the stressful burden of continuous involvement in investment decision-making.

Finally, as trust in the integrity of financial advisors significantly relates to individuals' annuity perceptions and intent, they play a key role in educating and creating awareness regarding forces/motives/cognitive biases present in annuity decision-making, as well as advocating annuitisation as a valuable part of an optimal AIP strategy, especially to those who have high risk aversion.

9.3 PRACTICAL IMPLICATIONS

The South African retirement fund system provides a good basic structure to members with respect to their retirement financial security. As a rule, an employee is usually obliged to belong and contribute to his/her employer's retirement fund as a condition of employment. The process of saving for retirement therefore runs mostly automatically. It is mostly not expected of the employee/member to make many difficult investment or product decisions during the wealth build-up or accumulation period, as retirement fund trustees are mandated by law to make such decisions on the members' behalf.

In many ways, the support structure for members of retirement funds seems to come to an abrupt end at retirement, when employees are suddenly faced by the challenge of converting their accumulated retirement fund capital into a sustainable income for life. Although South Africa has a sophisticated retirement fund industry offering many types of AIPs, individuals are often ill-equipped to consider the variety of complex interrelated factors when choosing an appropriate AIP. Subsequently, they often seek assistance from financial advisors, many of whom consider self-annuitisation as the default option.

Financially inexperienced and/or illiterate individuals require strong guidance from benefit counsellors in order to sensibly compare the range of product features provided by different AIPs, since an inappropriate choice can leave retirees financially vulnerable as they grow older, especially when they are no longer able to earn additional income, or are no longer capable of managing living annuity capital that involves difficult trade-offs.

Hence, in order to address the apparent shortcomings in the support structure of the retirement fund system assisting retirees with choosing an optimal AIP, the scientific findings of this study have the following practical implications for: (i) education; (ii) default annuity strategy; (iii) marketing; and (iv) an annuity decision-making tool.

9.3.1 Education

The main findings of this study could assist employers, via human resources departments and retirement fund trustees, to pro-actively educate their employees with respect to optimal AIP decision-making, in particular, by creating an awareness of the facts that: (i) the primary goal of retirement fund capital is to sustain oneself sufficiently throughout retirement; (ii) the extent of the responsibility/load in managing living annuity capital, especially in old age, can become unbearable; and (iii) guaranteed annuities inherently possess the ability to protect its holders against longevity and investment risk.

My grandmother on my father's side, Hendrika Catherina (Dol) de Villiers (1920-2016), who lectured clinical psychology at the University of the Free State, had a favourite saying in Afrikaans:

"As jy vry is dan is jy gebonde, en as jy gebonde is dan is jy vry."

This roughly translates into:

If you are free, then you are bound, and if you are bound, you are free.

And so, the freedom obtained by choosing the self-annuitant route carries a great responsibility and the burden to live with the potentially irremediable consequences of your choice. Alternatively, receiving a guaranteed income stream (either partly of in full), affords the freedom to live unbound without any further difficult investment decisions or possible detrimental consequences of outliving retirement capital.

9.3.2 Default annuity strategy and retirement benefit counselling after retirement

Since the publication of National Treasury's discussion paper (2012) that outlined the potential risks of the annuity puzzle, new default regulations were introduced, effective 1 March 2019. The new regulations aim to improve the outcome for members of retirement funds, by ensuring that they get good value for money and retire comfortably. Regulation 39 provides for the establishment of a default annuity strategy by retirement funds, as well as the provision of retirement fund benefits counselling. The annuity strategy can involve living and/or guaranteed annuities. The default annuity strategy is opt-in instead of opt-out.

The findings of this study offer retirement fund trustees some justification on which to base the inclusion of some form of longevity insurance in their choice of a suitable default annuity income strategy (that strives to balance the need for freedom and security with autonomy and structure) as this study shows that the responsibility of managing one's own investments could become a burden later in life.

Also, as legislation allows living annuitants to switch either in part or in full into a guaranteed annuity, based on the empirical results of this study, the question could be raised why retirement benefit counselling is not also provided for retired and previous retirement fund members, especially in the case of in-fund living annuitants to whom retirement fund trustees still have a fiduciary duty. Such switching options could be especially attractive to healthy retirees in their later retirement years as they may want to exchange the debilitating fear of outliving their capital and possibly leaving the burden of living annuity decision-making to a financially illiterate spouse, for the security of a guaranteed annuity income stream. Such guaranteed annuity rates may be especially attractive since the retiree has reached an advanced age. At this moment in time (January 2021) retirement benefit counselling is only available to retirement fund members, pre-retirement.

9.3.3 Marketing

This study provides important insights into the factors that relate to guaranteed annuity benefit perceptions and intent, which could assist life insurers in developing effective marketing material with an intention to create awareness and inform the public (who may or may not be longevity risk averse) on the unequivocal benefits of annuitisation.

9.3.3.1 Insight 1: Certainty matters

The attractiveness of a guaranteed annuity will depend on the extent to which retirees value a guaranteed annuity income stream for the rest of his/her life, with no further required active involvement, and thereby providing certainty – a luxury indeed, especially in these times of global political and economic uncertainty.

9.3.3.2 Insight 2: Longevity pooling

The perception of a guaranteed annuity as fair and equitable, depends largely on the annuitant's understanding and appreciation of the mechanisms underlying a formal guaranteed annuity market. One of these mechanisms refers to longevity pooling, where the annuity income payments from those who live longer are subsidised by those who die earlier. Annuitants are thus expected to forfeit their retirement capital to the life insurer when they annuitise in order to receive a guaranteed income stream for life. It could prove fruitful to make specific reference to longevity risk aversion in marketing material, as annuitisation could be especially advantageous to those with high longevity risk aversion.

9.3.3.3 Insight 3: Lifestyle choice

Guaranteed annuities offer retirees a lifestyle unencumbered by the fear of outliving retirement capital and the burden of managing retirement capital in old age. This way of living may be especially attractive and even imperative to those with a lower biological versus chronological age,[264] based on longer-than-average life expectancy.

9.3.4 Annuity decision-making tool

Based on the principal findings of this study, two questionnaires and user's manuals have been developed, to be used by counsellors and financial advisors when guiding their clients in making an informed and well-considered decision with respect to choosing an optimal AIP (See Appendix G and Appendix H). An annuity decision-making tool is still in development, and could be converted into a sophisticated and user-friendly software application in the near future.

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[264] Milevsky (2019) pointed out that retirees may have to provide themselves with an annuity income stream for much longer than anticipated, based on a lower biological versus chronological age.

9.3.4.1 Tool for pre-retirement use

The first questionnaire and user's manual are aimed at individuals in their pre-retirement period of having to choose between self-annuitisation and a guaranteed post-retirement income stream.

The questionnaire (See Appendix G) starts in Section A, with an introduction sheet explaining the main two AIPs available. Section B consists of questions that measure annuity desirability and intention to annuitise, linked to a seven-point Likert scale. Section C consists of basic YES/NO questions, and Section D includes demographic questions.

i) **Measuring living (alternatively guaranteed) annuity desirability**

As more extensively formulated in the manual (See Appendix G), if, in the questionnaire's Section B, the client scores high (5 to 7) on the questions that measure *living*[265] *(alternatively guaranteed)*[266] *annuity desirability*, the manual identifies the factors (with an interpretation) that underlie their perceptions, and proposes certain discussion points that could facilitate rational and holistic annuity decision-making debate between client and financial advisor/benefit counsellor.

If the client scores low (1 to 3) with respect to the questions that measure *living (alternatively guaranteed) annuity* desirability, he/she will probably score high on the factors that measure *guaranteed (alternatively living)* annuity desirability.

If the client scores low (1 to 3) or high (5 to 7) on all the questions that measure either type of annuity desirability, the financial advisor/counsellor should ensure that the client understands what each AIP entails. If the client scores 4 on most questions that measure annuity desirability, the client is deemed to be neutral with respect to AIP choice, which would necessitate further conversation between financial advisor/benefit counsellor and client in order to fully understand the client's lack of preference.

ii) **Measuring intention to annuitise**

If the client scores high (5 to 7) on the questions that measure the *intention to annuitise (decreasing factors)*[267]*/(increasing factors),*[268] the manual identifies the factors (with an interpretation) that underlie their intentions, and proposes certain discussion points that could facilitate rational and balanced annuity decision-making debate between client and financial advisor/benefit counsellor.

If the client scores low (1 to 3) with respect to the questions that measure *intention to annuitise* with respect to both the *decreasing (increasing)* factors he/she will probably score high on the factors that measure *increasing (decreasing)* factors.

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[265] See Table G.1.
[266] See Table G.2.
[267] See Table G.3.
[268] See Table G.4.

If the client scores low (1 to 3) or high (5 to 7) on all the questions that measure both decreasing and increasing factors with respect to intention to annuitise, the financial advisor/counsellor should ensure that the client understands what each AIP entails. If the client scores 4 on most questions that measure intention to annuitise, the client is deemed to be neutral with respect to AIP choice, which would necessitate further conversation between financial advisor/benefit counsellor and client in order to fully understand the client's lack of preference.

9.3.4.2 Tool for post-retirement use

The second questionnaire and user's manual are aimed at living annuitants in their post-retirement period. The questionnaire (See Appendix H) starts in Section A, with an introduction sheet explaining the main two AIPs available. Section B consists of questions that measure living annuity satisfaction levels, linked to a seven-point Likert scale. Section C consists of basic YES/NO questions, and Section D includes demographic questions.

Living annuitants may choose to follow either blended or switching strategies. If living annuitants are dissatisfied with their annuity choice after a thorough evaluation, the financial advisor could, after the reasons for the client's discontent have been established, advise the client to switch either entirely or in part into a guaranteed annuity product. Annuity rates can be especially favourable at older ages, as the life insurer does not expect to make many more payments.

As more extensively formulated in the manual (See Appendix H), if, in the questionnaire's Section B, the client scores high (5 to 7) on the questions that measure *living annuity satisfaction (alternatively dissatisfaction)*, the manual identifies the factors (with an interpretation) that underlie their *satisfaction levels (alternatively dissatisfaction)*, and proposes certain discussion points that could facilitate a balanced discussion regarding optimal annuity decision-making between the client and his/her financial advisor (See Table H.1 and Table H.2).

If the client scores low (1 to 3) with respect to the questions that measure *living annuity satisfaction (alternatively dissatisfaction)*, he/she will probably score high on the factors that measure *living annuity dissatisfaction (alternatively satisfaction)*.

If the client scores low (1 to 3) or high (5 to 7) on all the questions that measure either living annuity satisfaction/dissatisfaction or if the client scores a 4 on most of the questions, the client is deemed to be neutral with respect to his/her AIP choice, which would necessitate further conversation between financial advisor and client in order to fully understand his/her apathy.

So the tool, is not to optimise or to reach a "right" decision, but serves as a basis for discussion between the advisor and the client.

9.4 LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH

In Part 2 of this study, the factors that are associated with annuitants' satisfaction levels relating to the eventual outcome of their annuity decision, were investigated. Unfortunately, due to annuitants' observed apprehension towards life annuitisation, the obtained sample was not large enough for reliable statistical analysis. Future research into the factors that are associated with the satisfaction levels of life annuitants, as well as annuitants that follow blended annuity income strategies, could further enhance understanding of the annuity puzzle.

Due to the low response rate in both parts of the study, a potential limitation is non-response bias, and therefore the lack of generalisability of the findings to the target population.

The cross-sectional data collection methodology followed in this study required different samples for Part 1 and Part 2. Future research studies conducted in annuity decision-making could be based instead on a longitudinal data collection methodology, according to which it will be determined how a respondent's initial benefit perception and intention to annuitise before retirement eventually translates into his/her subsequent satisfaction with respect to annuity choice.

In the respective questionnaires presented in Parts 1 and 2, the questions/scales are based on both the researcher's own and other researchers' work. A few factors of this study were however not compared with those of other researchers, due to the lack of empirical evidence given in some of these studies. Questions used in this study to measure constructs were derived from questions used in other similar studies, but in some cases differ substantially. Also, the scales used in this study differ from the scales used in other studies. Hence, there appears to be empirical limitations with respect to the degree to which results offered by this study can be compared with results offered by other similar studies. The identification of factors that relate to annuity perception, intention and satisfaction could be further expanded by means of future validation studies, thereby contributing further to the existing body of literature on the annuity puzzle.

Our academic community's continued efforts in recognising and analysing the forces that relate to annuity decision-making are key in facilitating fruitful debate on optimal annuity income product decision-making.

The financial security of retirees depends on it.

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APPENDIX A:

LETTERS OF INVITATION TO RESPONDENTS

Table A.1: Letters of invitation – Stellenbosch University

Part 1: Letter 1[269]
Dear member of the University of Stellenbosch Retirement Fund (USRF) *You are hereby invited to participate in a PhD study regarding members' perceptions and potential future decision-making with respect to retirement income options, by completing a survey. The aim of the research is, among others, to assist the USRF in their pursuit to advise and counsel members on their decision-making regarding their choice of an optimal retirement income product.* *Your participation is voluntary and the survey will be completed anonymously to ensure confidentiality.* *The survey will take about 10 minutes to complete.* *If you have any questions or concerns about the research, please feel free to contact the researcher, Mrs Jeannie de Villiers-Strijdom [jeannie@sun.ac.za; 083 318 1780] or one of her supervisors, Prof Niel Krige [jdkrige@sun.ac.za] and Prof Johann de Villiers [judv@sun.ac.za].* *You are kindly requested to complete this survey by **10 September 2019**. Your response will be automatically submitted once the final question has been answered.* *Thank you for your cooperation.* *Japie Kotzé* *Principal Officer: Stellenbosch University Retirement Fund* ***Follow this link to the Survey:*** *Take the Survey*

[269] Letter sent on 2 September 2019. The letter refers to 'retirement income product'. Later in the research study, this term is referred to as annuity income product.

Part 1: Letter 2[270]

Dear member of the University of Stellenbosch Retirement Fund (USRF)

On 2 September 2019 you received an invitation to participate in a PhD study regarding members' perceptions and potential future decision-making with respect to retirement income options, by completing a survey. The aim of the research is, among others, to assist the USRF in their pursuit to advise and counsel members on their decision-making regarding their choice of an optimal retirement income product.

Since the invitation and survey link were sent out via email, some USRF members have expressed certain concerns, which I would like to address as follows:

The legitimacy of the study. Mrs Jeannie de Villiers-Strijdom [jeannie@sun.ac.za; 083 318 1780], a PhD student at the Department of Business Management, Faculty of Economic and Management Sciences, Stellenbosch University, is conducting the study under the supervision of Prof Niel Krige [jdkrige@sun.ac.za] and Prof Johann de Villiers [judv@sun.ac.za]. She has received the necessary ethical clearance from:

1) the Departmental Ethics Screening Committee (DESC), 2) the Research Ethics Committee (REC) (approval number 9101), and 3) the Division for Information Governance (approval number IRPSD1251).

Technological safety. The Department of Business Management has a licence to use Qualtrics, a sophisticated survey software programme used to administer survey-based research. Qualtrics owns a set of email domains from which emails are sent to maintain high email deliverability. If they were to send email messages from an email domain that they do not own, such emails would likely end up in an individual's spam folder. The invitation and survey link were sent from the @qemailserver.com domain. Prof Christo Boshoff (Vice Dean: Research and Head of the Department of Business Management), who assists the researcher with her survey, has given his assurance that emails from this Qualtrics domain have never before compromised any individual's technological safety. As principal officer of the USRF, I have personally agreed to send the invitation and survey link to US employees and USRF members via email on the researcher's behalf, as we hope the research will ultimately contribute to the improvement of our service delivery to retiring USRF members.

[270] Letter sent on 12 September 2019. The letter refers to 'retirement income product'. Later in the research study, this term is referred to as annuity income product.

As per the invitation sent on 2 September 2019, please take note of the following:

- *Your participation is voluntary and the survey will be completed anonymously to ensure confidentiality.*
- *The survey should take about 10 minutes to complete.*
- *If you have any questions or concerns about the research, please feel free to contact the researcher, Mrs Jeannie de Villiers-Strijdom [jeannie@sun.ac.za; 083 318 1780] or one of her supervisors, Prof Niel Krige [jdkrige@sun.ac.za] and Prof Johann de Villiers [judv@sun.ac.za].*
- *If you have clicked on the survey link before, you are kindly requested to complete the survey by 19 September 2019 (09:00).*
- *If you click on the survey link for the first time today, you are kindly requested to complete the survey by 26 September 2019 (17:00). Your response will be automatically submitted once the final question has been answered.*

I am truly hopeful that the outcome of this research will contribute to USRF members' optimal decision-making with respect to their choice of a retirement income product, with the end goal of enjoying a secure and fulfilling retirement. Your participation in this study will be highly valued.

Regards

Japie Kotzé
Director: Human Resources and Principal Officer of the USRF

Part 2: Letter[271]

Dear retiree of Stellenbosch University (SU)

You are hereby invited to participate in a PhD study regarding retirees' perceptions, decision-making and satisfaction with respect to their choice of a retirement income option, by completing a survey. The aim of the research is, among others, to assist the USRF in their pursuit to advise and counsel retirees on their decision-making regarding their choice of an optimal retirement income product.

Your participation is voluntary and the survey will be completed anonymously to ensure confidentiality.

The survey will take about 15 minutes to complete.

If you have any questions or concerns about the research, please feel free to contact the researcher, Mrs Jeannie de Villiers-Strijdom [jeannie@sun.ac.za; 083 318 1780] or one of her supervisors, Prof Niel Krige [jdkrige@sun.ac.za] and Prof Johann de Villiers [judv@sun.ac.za].

*You are kindly requested to complete this survey by **26 June 2020**. Your response will be automatically submitted once the final question has been answered.*

Thank you for your cooperation.

Japie Kotzé
Principal Officer: Stellenbosch University Retirement Fund

Link to the survey:
https://sun.qualtrics.com/jfe/form/SV_5aPdpUq2TOSFKDz

[271] Letter sent on 4 June 2020. The letter refers to 'retirement income product'. Later in the research study, this term is referred to as annuity income product.

Table A.2: Letter of invitation – Exxaro[272]

Part 1
Dear member of the Exxaro Pension and Provident Funds (the Funds), *You are hereby invited to participate in a PhD study regarding members' perceptions and potential future decision-making with respect to retirement income options, by completing a survey. The aim of the research is, among others, to also assist the trustees of the Funds in their pursuit to educate and counsel members on their decision-making regarding their choice of an optimal retirement income product.* *Your participation is voluntary and the survey will be completed anonymously to ensure confidentiality.* *The survey will take about 10 minutes to complete.* *Link to participate in survey: https://sun.qualtrics.com/jfe/form/SV_5AoBCeXWveq1yfz* *If you have any questions or concerns about the research, please feel free to contact the researcher, Mrs Jeannie de Villiers-Strijdom [jeannie@sun.ac.za; 083 318 1780] or one of her supervisors, Prof Niel Krige [jdkrige@sun.ac.za] and Prof Johann de Villiers [judv@sun.ac.za].* *You are kindly requested to complete this survey by* ***17 April 2020****. Your response will be automatically submitted once the final question has been answered.* *I am truly hopeful that the outcome of this research will contribute to the members' optimal decision-making with respect to their choice of a retirement income product, with the end goal of enjoying a secure and fulfilling retirement. Your participation in this study will be highly valued in our strive to improve our service delivery to retiring members.* *Thank you in advance for your kind cooperation.* *Kind regards,* *Vanisha Balgobind* *Executive Head: Human Resources, Exxaro*

[272] Letter sent on 3 April 2020. The letter refers to 'retirement income product'. Later in the research study, this term is referred to as annuity income product.

Table A.3: Letter of invitation – Glacier[273]

Part 2
Dear retiree *Glacier is assisting a Stellenbosch University PhD researcher, Mrs Jeannie de Villiers-Strijdom, with her research and would like to hereby extend an invitation to you to participate in the study.* *The study is about retirees' perceptions, understanding and decision-making with respect to retirement income options, by completing a survey. The aim of the research is, among others, to assist the retirement fund industry in their pursuit to educate, counsel and advise retirees on their decision-making regarding their choice of an optimal retirement income product.* *Your participation is completely voluntary and the survey will be completed anonymously to ensure confidentiality. Please note that no personal details or any form of financial/confidential information have been shared with any third party and Glacier adheres to strict confidentiality – the researcher will only have access to the answers that you provide in the survey.* *The survey will take about 15 minutes to complete. You are welcome to leave the survey at any moment and will not be penalised in any way.* *If you have any questions or concerns about the research, please feel free to contact the researcher directly, Mrs Jeannie de Villiers-Strijdom [jeannie@sun.ac.za; 083 318 1780] or one of her supervisors, Prof Niel Krige [jdkrige@sun.ac.za] and Prof Johann de Villiers [judv@sun.ac.za].* *You are kindly requested to complete this survey by* ***9 June 2020****. Your response will be automatically submitted once the final question has been answered.* *We truly hopeful that the outcome of this research will contribute to retirees' optimal decision-making with respect to their choice of a retirement income product, with the end goal of enjoying a secure and fulfilling retirement. Your participation in this study will be highly valued in our strive to improve our service delivery to retirees.* *Thank you in advance for your kind cooperation.* ***Follow this link to the Survey:*** ***https://sun.qualtrics.com/jfe/form/SV_1O1Wk7S0rvKgim9*** *Kind regards* *Natashja Terblanche* *Head: Client Services; Glacier Financial Solutions (Pty) Ltd, A member of the Sanlam Group*

[273] Letter sent on 26 May 2020. The letter refers to 'retirement income product'. Later in the research study, this term is referred to as annuity income product.

APPENDIX B:

SURVEY QUESTIONS

Table B.1: Part 1: Benefit perceptions of living annuities

Question 1	
Question 1.1	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I could withdraw above-average income from a living annuity each year. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I would probably do better by investing my retirement capital in a living annuity, because my capital would have the potential to grow.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Investor confidence/Higher returns HE1&2: Individuals who think they can earn above-average income, as well as generate capital growth from a living annuity, have high confidence levels in their own investment skills and/or the investment skills of financial advisors. They are thus more likely to view self-annuitisation as favourable. (This could be as a result of annuitants viewing living annuities through the investment frame). VUAP1&2: Investor confidence R1-2: Individuals with investment skills, or individuals who have access to such skills, can invest their retirement monies in a variety of asset classes, for example equities, and could potentially earn superior rates of return. If the underlying investment portfolio generates a good return, living annuitants are able to withdraw annuity income in excess of what a guaranteed annuity could provide. In comparison, in order to cover their liabilities towards life annuitants, life insurers are limited in terms of investable asset classes. (See Section 4.4.2 (ii) and Section 4.3 (vi)) (Also indication that investors view annuities using an investment frame. See Section 3.4.3 and Section 4.2.10)
Question 1.2	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I like the flexibility and control of managing a living annuity. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It would be important to choose the amount of income I receive in retirement each year.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Flexibility HE: Individuals who prefer flexibility and control may have view self-annuitisation favourably. VUAP1: Desire for flexibility and control of retirement capital VUAP2: The importance to choose the amount of income in retirement each year VUAP3: The importance to choose the financial advisor that manages retirement capital VUAP4: The importance to annuitants to choose underlying investments themselves R: Living annuities allow for more flexibility and control in terms of, among others, underlying investments and withdrawals. (See Section 4.2.8 and Section 4.4.2 (i))

It would be important to choose the financial advisor who manages the underlying investments of my capital in retirement. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It would be important to choose the underlying investments of my capital in retirement myself.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	
Question 1.3	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
At death, it is important to me to leave my remaining retirement capital to my heirs. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *My family would fund any shortfall I might have in retirement, in return for inheriting any money left in my living annuity.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is important to me to leave an inheritance to my heirs at death.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Bequest HE1: Individuals who have a bequest motive with respect to their retirement capital may have a positive outlook towards living annuities. HE2: Individuals, who privately pool longevity risk, may have a positive outlook towards living annuities. HE3: Individuals who have a bequest motive may perceive living annuities as beneficial. VUAP1: Remaining capital to heirs VUAP2: Risk-sharing within families VUAP3: Leaving bequest to heirs at death R1: The remaining balance in a living annuity can be passed on to heirs as an inheritance at death. R2: Individuals, who privately pool longevity risk, have no need to insure this risk in the commercial market. R3: Individuals who have a strong desire to leave their assets to heirs at death, will appreciate that they could leave the remaining balance in a living annuity to heirs as an inheritance at death. (See Section 4.2.1 and Section 4.4.2 (iii)) (For spouse: See Section 4.4.6) (Non-significant/inconclusive: See Sections 4.1.1, 4.4.3 and 4.4.5) (See Section 4.2.5 and Section 4.3 (iii))

Question 1.4	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
A living annuity is desirable as it allows me access to my retirement capital to pay for unforeseen expenses – for example medical costs or home repairs. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is important to have access to cash during retirement for emergencies.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Access HE1 & H2: Individuals who have liquidity constraints, will prefer self-annuitisation. VUAP1&2: Need for liquidity R1&2: Living annuitants have greater access to retirement capital to pay for unforeseen expenses, as they can choose a withdrawal rate each year subject to a minimum of 2.5% and a maximum of 17.5% of the underlying balance in a living annuity account. (See Section 4.2.4 and Section 4.3 (v))
Question 1.5	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I prefer investments that offer high returns, even if it is a risky decision. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I try to avoid financial risk.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Risk aversion HE1&2: Stronger risk aversion reduces a positive perception on living annuities. VUAP1: Investment risk/return trade-off VUAP2: Self-reported financial risk aversion R1-2: Individuals who are more risk averse are less likely to view self-annuitisation as beneficial, as they value the longevity and investment risk protection offered by guaranteed annuities. (See Sections 4.4.1, 4.4.5, 4.4.6; Non-significant: Section 4.4.3.)

Question 1.6	Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)
I would probably live long enough for a guaranteed annuity to be worthwhile. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I fear dying soon after retirement.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I fear outliving my retirement capital.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is likely that I survive to age 75.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS) *It is likely that I survive to age 85.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Mortality risk/Early death HE1: Individuals with high mortality risk are more likely to view self-annuitisation as beneficial. HE2: Individuals who fear dying soon after retirement are more likely to perceive self-annuitisation favourably. (Also indication that investors overweighing the probability of near periods as explained in risk-order bias.) HE3: Individuals who fear outliving their retirement capital, are less likely to have a positive outlook on self-annuitisation. HE4-6: Higher mortality risk increases the benefit perceptions of self-annuitisation. HE7: Individuals who are uncertain about their length of life are more likely to perceive self-annuitisation as beneficial. (Loss aversion increases with an increase in uncertainty about length-of-life). VUAP1: Whether individuals think they will live long enough to benefit from annuitisation. VUAP2: Fear of dying soon after retirement VUAP3: Fear of outliving retirement capital VUAP4-6: Subjective survival probability VUAP7: Uncertainty about survival prospects at retirement R1: Individuals who die soon after retirement will be better off buying a living annuity, as they will earn a higher return on their investment and have greater access to money for health or other unforeseen expenses. R2: Life annuitants lose their retirement capital at death (except where another life is added onto the policy or a guarantee term applies). Living annuitants on the other hand can bequeath the remaining capital in their living annuity accounts to heirs at death. R3: Living annuitants bear the risk of outliving their retirement capital as their funds may become depleted. R4-6: Individuals with long life expectancies have more to benefit from annuitisation as they can expect more pension income payments. R7: Individuals who have less certainty about their own survival prospects at retirement, have less to benefit from annuitisation as they have no certainty about the amount of pension income payments they will receive from a guaranteed annuity. (See Section 4.3 ii and Sections 4.4.1, 4.4.2, 4.4.3 and 4.4.4 as they relate to health) Mortality risk, as it relates to health, is non-significant in Inkmann et al. (2011) (See Section 4.4.6) (Also see Section 3.4.4 and Section 4.2.10 for a discussion on risk-order bias) (See also loss aversion in Section 3.4.1)

It is likely that I survive to age 90 and beyond. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS) *I am uncertain about my own biological survival prospects at retirement.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	
Question 1.7	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Financial advisors selling living annuities pursue only their own self-interested goals. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I believe that financial advisors selling living annuities have their clients' best interests at heart.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Trust in financial advisors selling living annuities HE1: Individuals who think that financial advisors selling living annuities pursue only their self-interested goals may reduce living annuity benefit perceptions. HE2: Individuals who believe that financial advisors selling living annuities have their clients' best interests at heart may increase living annuity benefit perceptions. VUAP1: Whether individuals think that financial advisors selling living annuities pursue only their self-interested goals. VUAP2: Whether individuals believe that financial advisors selling living annuities have their clients' best interests at heart. R1&2: Financial advisors selling living annuities earn an ongoing fee, as a percentage of the underlying investment amount. (See Section 2.3.1) (Exploratory)
Question 1.8	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
A living annuity makes me think about my own death. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Mortality salience HE: If a living annuity makes individuals think about their own death, they may not view living annuities as beneficial. VUAP: Whether a living annuity makes individuals think about their own death. R: The remaining capital of an individual's living annuity account may be bequeathed to heirs and therefore keeps on living. (See Section 3.4.5 and Section 4.2.10)

Question 1.9	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I am familiar with retirement income options. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I educate myself on retirement income options.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I have consulted with a financial advisor about retirement income options.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Awareness (*Consumer awareness and education could be an indicator of financial literacy.*) HE: Individuals who are more familiar with annuity income products may reduce the benefit perceptions of living annuities. VUAP1: Familiarity with retirement income options. VUAP2: Active self-education on retirement income options. VUAP3: Consultations with a financial advisor about retirement income options. R1-3: Individuals who are familiar with retirement income options, and actively educate themselves, as well as consult with professionals regarding such options, are more likely to choose an annuity that will protect them against longevity and investment risks in retirement. In addition, they are in a better position to weigh the benefits and disadvantages of annuitisation versus self-annuitisation. (See Section 4.2.9)
Question 1.10	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I regard myself as someone who is patient. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I make financial planning decisions quickly.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Patience HE1&2: Less patient individuals may view self-annuitisation as beneficial. VUAP1: Self-reported general level of impatience VUAP2: Speed of financial decision-making R1&2: Individuals who are impatient and who make financial decisions quickly, are less likely to annuitise, as it requires some patience in waiting for each guaranteed annuity payment. With a living annuity, however, individuals are allowed to withdraw larger amounts in any given year. (See Sections 4.4.1, 4.4.2, 4.4.3 and 4.4.4) Note: The HRS uses the time horizon for financial decisions (also referred to as time rate of preference or time rate of discount) as a measure of patience. The measures used in this study to capture patience therefore differ from the measure used by the HRS. Hence, there would appear to be limitations in comparing the results of this study with other similar studies based on HRS data.

Question 1.11	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
It makes sense to invest money in the shares of more than one company. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from SHIW) *Investing in retirement funds has the same tax advantages as other investment funds. / All retirement funds guarantee to pay retirees a pension until their death. / Pension fund law prohibits retirement funds to invest in shares.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from SHIW)	D: Financial literacy HE: Higher financial literacy may translate into lower benefit perceptions of living annuities. VUAP1: Knowledge of diversification. (In Cappelletti et al. (2013) people who have knowledge of diversification annuitise significantly less.) VUAP2: Pension literacy. (Significant positive correlation with annuitisation in Cappelletti et al. (2013)) R1-2: Understanding pension and other financial matters could encourage annuitisation, as individuals may understand the benefits of annuitisation better. However, individuals with investment knowledge may think that they could earn superior rates of return by rather investing the money themselves in a living annuity product. (See Section 4.4.3) Note: The questions used to measure financial literacy were derived from the questions used by the SHIW to measure financial literacy. The measures used in this study to capture financial literacy therefore differ from the measures used by the SHIW. Hence, there would appear to be limitations in comparing the results of this study with other similar studies based on SHIW data.

Table B.2: Part 1: Benefit perceptions of guaranteed annuities

Question 1	
Question 1.1	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I could withdraw sufficient income from a guaranteed annuity each year. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is unfair that insurance companies offering guaranteed annuities keep the excess funds at the annuitant's death.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from Shu et al., 2016) *It makes sense to exchange my retirement capital for a guaranteed income stream for life.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *Insurance companies rip people off.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Fairness HE1: Individuals who think that the annuity income from a guaranteed annuity is sufficient, are more likely to view annuitisation as beneficial. HE2: Individuals who think that it is unfair that insurance companies offering guaranteed annuities keep the excess funds at the annuitant's death, are less likely to view annuitisation as favourable. (Could be indication of endowment effect. See Section 3.4.1). HE3: Individuals who think it makes sense to part with retirement capital in return for a guaranteed income stream will have a positive outlook towards annuitisation. HE4: Individuals who think that life insurance companies selling guaranteed annuities rip annuitants off, will reduce the benefit perceptions of annuitisation. VUAP1: Sufficiency of income from guaranteed annuity VUAP2: Whether individuals think it is unfair that insurance companies selling guaranteed annuities keep the excess funds at the annuitant's death. VUAP3: Whether individuals think it makes sense to exchange their retirement capital for an income stream for life. VUAP4: Whether individuals think insurance companies selling guaranteed annuities rip people off. R1: Life insurers typically invest in interest-bearing instruments to match/cover their liability of pension income payments to life annuitants. The income paid to annuitants is therefore determined, among others, by the underlying assets backing the insurer's liability. In addition, life insurers have to account for administration costs and profit, which may reduce the amount of annuity income paid to life annuitants. Moreover, due to the effects of adverse selection, life insurers have to compensate for the fact that annuitants with longer than average life expectancies, tend to purchase guaranteed annuities. (Guaranteed annuity income payments are also determined by the annuitant's capital lump sum paid over to the life insurer, gender and age.) R2: A guaranteed annuity ends at the annuitant's death, provided no guarantee terms apply, and it is a single-life policy. Income payments from those who live long are subsidised by those who die early. R3: Annuitants forfeit their retirement capital to the life insurer when they annuitise in order to receive a guaranteed income stream for life. R4: Income payments are reduced by loadings that arise due to administration costs, profit-taking and adverse selection. (See Section 4.2.2, Section 4.2.7 and Section 4.3 (vii)) (See also Section 4.2.10 and Section 3.4.1)

Question 1.2	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I feel confident that insurance companies offering guaranteed annuities will survive over the long term. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *Purchasing a guaranteed annuity from only one insurance company is risky, as that company could become insolvent.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Default risk HE1&2: Individuals who are more concerned that life insurance companies might not survive over the long term are less likely to view annuitisation as beneficial. OR HE1&2: Individuals who are more concerned that life insurance companies might not survive over the long term are more likely to view annuitisation as beneficial. VUAP1: Whether individuals think life insurance companies will survive over the long term. VUAP2: Whether individuals think that purchasing a guaranteed annuity from only one insurance company exposes them to diversification risk, should any specific company become insolvent. R1&2: Individuals may fear that life insurance companies that do not survive over the long term could default on guaranteed annuity payments (e.g. in the event of the pool of life annuitants living longer than expected). OR R1&2: Individuals influenced by such an unlikely event as insurance companies defaulting on guaranteed annuity income payments, may be regarded as highly risk-averse and may therefore favour annuitisation due to the protection it offers against longevity and investment risks. Similarly individuals who think such an event is highly unlikely present risk seeking behaviour, and may thus be less prone to annuitisation. (See Section 4.2.6)
Question 1.3	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I prefer investments that offer high returns, even if it is a risky decision. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I try to avoid financial risk.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Risk aversion HE1&2: Stronger risk aversion increases the benefit perceptions of guaranteed annuities. VUAP1: Investment risk/return trade-off VUAP2: Self-reported financial risk aversion R1-2: Individuals who are more risk averse are more likely to annuitise, as they value the longevity and investment risk protection offered by guaranteed annuities. (See Sections 4.4.1, 4.4.5, 4.4.6; Non-significant: Section 4.4.3.)

Question 1.4	Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)
I would probably live long enough for a guaranteed annuity to be worthwhile. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I fear dying soon after retirement.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I fear outliving my retirement capital.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is likely that I survive to age 75.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS) *It is likely that I survive to age 85.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Mortality risk/Early death HE1: Individuals with high mortality risk are less likely to perceive annuitisation as beneficial. HE2: Individuals who fear dying soon after retirement are less likely to view annuitisation as favourable. (Also indication that investors overweighing the probability of near periods as explained in risk-order bias.) HE3: Individuals who fear outliving their retirement capital, are more likely to perceive annuitisation as beneficial. HE4-6: Higher mortality risk relates to a reduction in the benefit perceptions of guaranteed annuities. HE7: Individuals who are uncertain about their length of life are less likely to view annuitisation as favourable. (Loss aversion increases with an increase in uncertainty about length-of-life). VUAP1: Whether individuals think they will live long enough to benefit from annuitisation. VUAP2: Fear of dying soon after retirement VUAP3: Fear of outliving retirement capital VUAP4-6: Subjective survival probability VUAP7: Uncertainty about survival prospects at retirement R1: Individuals who die soon after retirement will be better off buying a living annuity, as they will earn a higher return on their investment and have greater access to money for health or other unforeseen expenses. R2: Life annuitants lose their retirement capital at death (except where another life is added onto the policy or a guarantee term applies). Living annuitants on the other hand can bequeath the remaining capital in their living annuity accounts to heirs at death. R3: Living annuitants bear the risk of outliving their retirement capital as their funds may become depleted. R4-6: Individuals with long life expectancies have more to benefit from annuitisation as they can expect more pension income payments. R7: Individuals who have less certainty about their own survival prospects at retirement, have less to benefit from annuitisation as they have no certainty about the amount of pension income payments they will receive from a guaranteed annuity. (See Section 4.3 ii and Sections 4.4.1, 4.4.2, 4.4.3 and 4.4.4 as they relate to health) Mortality risk, as it relates to health, is non-significant in Inkmann et al. (2011) (See Section 4.4.6) (Also see Section 3.4.4 and Section 4.2.10 for a discussion on risk-order bias) (See also loss aversion in Section 3.4.1)

It is likely that I survive to age 90 and beyond. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS) *I am uncertain about my own biological survival prospects at retirement.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	
Question 1.5	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Financial advisors selling guaranteed annuities pursue only their own self-interested goals. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I believe that financial advisors selling guaranteed annuities have their clients' best interests at heart.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Trust in financial advisors selling guaranteed annuities HE1: Individuals who think that financial advisors selling guaranteed annuities pursue only their self-interested goals are less likely to have a positive outlook towards annuitisation. HE2: Individuals who believe that financial advisors selling guaranteed annuities have their clients' best interests at heart, are more likely to have a positive outlook towards annuitisation. VUAP1: Whether individuals think that financial advisors selling guaranteed annuities pursue only their self-interested goals. VUAP2: Whether individuals believe that financial advisors selling guaranteed annuities have their clients' best interests at heart. R1&2: Financial advisors selling guaranteed annuities earn commission when they sell guaranteed annuities. (See Section 2.3.1) (Exploratory)

Question 1.6	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
A guaranteed annuity makes me think about my own death. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Mortality salience HE: If a guaranteed annuity makes individuals think about their own death, it will reduce their benefit perceptions of annuitisation. VUAP: Whether a guaranteed annuity makes individuals think about their own death. R: Guaranteed annuity income payments cease at death. (See Section 3.4.5 and Section 4.2.10)
Question 1.7	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I am familiar with retirement income options. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I educate myself on retirement income options.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I have consulted with a financial advisor about retirement income options.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Awareness (*Consumer awareness and education could be an indicator of financial literacy.*) HE: Individuals who are more familiar with annuity income products are more likely to perceive annuitisation as beneficial. VUAP1: Familiarity with retirement income options. VUAP2: Active self-education on retirement income options. VUAP3: Consultations with a financial advisor about retirement income options. R1-3: Individuals who are familiar with retirement income options, and actively educate themselves, as well as consult with professionals regarding such options, are more likely to choose an annuity that will protect them against longevity and investment risks in retirement. In addition, they are in a better position to weigh the benefits and disadvantages of annuitisation versus self-annuitisation. (See Section 4.2.9)

Question 1.8	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I regard myself as someone who is patient. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I make financial planning decisions quickly.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Patience HE1&2: Less patient individuals will view annuitisation as less beneficial. VUAP1: Self-reported general level of impatience VUAP2: Speed of financial decision-making R1&2: Individuals who are impatient and who make financial decisions quickly, are less likely to annuitise, as it requires some patience in waiting for each guaranteed annuity payment. With a living annuity, however, individuals are allowed to withdraw larger amounts in any given year. (See Sections 4.4.1, 4.4.2, 4.4.3 and 4.4.4) Note: The HRS uses the time horizon for financial decisions (also referred to as time rate of preference or time rate of discount) as a measure of patience. The measures used in this study to capture patience therefore differ from the measure used by the HRS. Hence, there would appear to be limitations in comparing the results of this study with other similar studies based on HRS data.
Question 1.9	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
It makes sense to invest money in the shares of more than one company. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from SHIW) *Investing in retirement funds has the same tax advantages as other investment funds. / All retirement funds guarantee to pay retirees a pension until their death. / Pension fund law prohibits retirement funds to invest in shares.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from SHIW)	D: Financial literacy HE: Higher financial literacy may relate to higher benefit perceptions of guaranteed annuities. VUAP1: Knowledge of diversification. (In Cappelletti et al. (2013) people who have knowledge of diversification annuitise significantly less.) VUAP2: Pension literacy. (Significant positive correlation with annuitisation in Cappelletti et al. (2013)) R1-2: Understanding pension and other financial matters could encourage annuitisation, as individuals may understand the benefits of annuitisation better. However, individuals with investment knowledge may think that they could earn superior rates of return by rather investing the money themselves in a living annuity product. (See Section 4.4.3) Note: The questions used to measure financial literacy were derived from the questions used by the SHIW to measure financial literacy. The measures used in this study to capture financial literacy therefore differ from the measures used by the SHIW. Hence, there would appear to be limitations in comparing the results of this study with other similar studies based on SHIW data.

Question 1.10	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I prefer to know exactly what my future income stream will be. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I prefer a guaranteed annuity that runs automatically and that requires no further decision-making from me.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I prefer a guaranteed income stream for life.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Certainty HE1: Individuals who prefer to know exactly what their income stream will be in advance, will be more likely to view guaranteed annuities as favourable. HE2: Individuals who prefer their income stream to run automatically without further decision-making from them will be more likely to view annuitisation as favourable. HE3: Individuals who prefer a guaranteed income stream for life, are more likely to have a positive outlook towards annuitisation. VUAP1: Knowing in advance what income stream will be VUAP2: Preference for annuity income that runs automatically with no other interference from annuitant VUAP3: Preference for a guaranteed income stream for life R1: Guaranteed annuities provide a pre-determined income stream for life. R2: Guaranteed annuities provide a pre-determined income stream for life and require no further decision-making from annuitant. R3: Individuals may prefer a guaranteed income to a flexible income stream that is dependent on volatile and unpredictable investment returns. (See Section 2.4.1) (Exploratory)

Table B.3: Part 1: Intent to annuitise

Question 1	
Question 1.1	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I could withdraw sufficient income from a guaranteed annuity each year. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is unfair that insurance companies offering guaranteed annuities keep the excess funds at the annuitant's death.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from Shu et al., 2016) *It makes sense to exchange my retirement capital for a guaranteed income stream for life.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *Insurance companies rip people off.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Fairness HE1: Individuals who think that the annuity income from a guaranteed annuity is sufficient, are more likely to annuitise. HE2: Individuals who think that it is unfair that insurance companies offering guaranteed annuities keep the excess funds at the annuitant's death, will be less likely to annuitise. (Could be indication of endowment effect. See Section 3.4.1). HE3: Individuals who think it makes sense to part with retirement capital in return for a guaranteed income stream will annuitise more. HE4: Individuals who think that life insurance companies selling guaranteed annuities rip annuitants off, are less likely to annuitise. VUAP1: Sufficiency of income from guaranteed annuity VUAP2: Whether individuals think it is unfair that insurance companies selling guaranteed annuities keep the excess funds at the annuitant's death. VUAP3: Whether individuals think it makes sense to exchange their retirement capital for an income stream for life. VUAP4: Whether individuals think insurance companies selling guaranteed annuities rip people off. R1: Life insurers typically invest in interest-bearing instruments to match/cover their liability of pension income payments to life annuitants. The income paid to annuitants is therefore determined, among others, by the underlying assets backing the insurer's liability. In addition, life insurers have to account for administration costs and profit, which may reduce the amount of annuity income paid to life annuitants. Moreover, due to the effects of adverse selection, life insurers have to compensate for the fact that annuitants with longer than average life expectancies, tend to purchase guaranteed annuities. (Guaranteed annuity income payments are also determined by the annuitant's capital lump sum paid over to the life insurer, gender and age.) R2: A guaranteed annuity ends at the annuitant's death, provided no guarantee terms apply, and it is a single-life policy. Income payments from those who live long are subsidised by those who die early. R3: Annuitants forfeit their retirement capital to the life insurer when they annuitise in order to receive a guaranteed income stream for life. R4: Income payments are reduced by loadings that arise due to administration costs, profit-taking and adverse selection. (See Section 4.2.2, Section 4.2.7 and Section 4.3 (vii)) (See also Section 4.2.10 and Section 3.4.1)

Question 1.2	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I could withdraw above-average income from a living annuity each year. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I would probably do better by investing my retirement capital in a living annuity, because my capital would have the potential to grow.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Investor confidence/Higher returns HE1&2: Individuals who think they can earn above-average income, as well as generate capital growth from a living annuity, have high confidence levels in their own investment skills and/or the investment skills of financial advisors. They are thus more likely to self-annuitise. (This could be as a result of annuitants viewing living annuities through the investment frame). VUAP1&2: Investor confidence R1-2: Individuals with investment skills, or individuals who have access to such skills, can invest their retirement monies in a variety of asset classes, for example equities, and could potentially earn superior rates of return. If the underlying investment portfolio generates a good return, living annuitants are able to withdraw annuity income in excess of what a guaranteed annuity could provide. In comparison, in order to cover their liabilities towards life annuitants, life insurers are limited in terms of investable asset classes. (See Section 4.4.2 (ii) and Section 4.3 (vi)) (Also indication that investors view annuities using an investment frame. See Section 3.4.3 and Section 4.2.10)
Question 1.3	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I like the flexibility and control of managing a living annuity. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It would be important to choose the amount of income I receive in retirement each year.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Flexibility HE: Individuals who prefer flexibility and control are less prone to annuitising retirement capital. VUAP1: Desire for flexibility and control of retirement capital VUAP2: The importance to choose the amount of income in retirement each year VUAP3: The importance to choose the financial advisor that manages retirement capital VUAP4: The importance to annuitants to choose underlying investments themselves R: Living annuities allow for more flexibility and control in terms of, among others, underlying investments and withdrawals. (See Section 4.2.8 and Section 4.4.2 (i))

It would be important to choose the financial advisor who manages the underlying investments of my capital in retirement. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It would be important to choose the underlying investments of my capital in retirement myself.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	
Question 1.4	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
At death, it is important to me to leave my remaining retirement capital to my heirs. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *My family would fund any shortfall I might have in retirement, in return for inheriting any money left in my living annuity.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is important to me to leave an inheritance to my heirs at death.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Bequest HE1: Individuals who have a bequest motive with respect to their retirement capital will be less likely to annuitise. HE2: Individuals, who privately pool longevity risk, are less likely to annuitise. HE3: Individuals who have a bequest motive will be less likely to annuitise. VUAP1: Remaining capital to heirs VUAP2: Risk-sharing within families VUAP3: Leaving bequest to heirs at death R1: The remaining balance in a living annuity can be passed on to heirs as an inheritance at death. R2: Individuals, who privately pool longevity risk, have no need to insure this risk in the commercial market. R3: Individuals who have a strong desire to leave their assets to heirs at death, will appreciate that they could leave the remaining balance in a living annuity to heirs as an inheritance at death. (See Section 4.2.1 and Section 4.4.2 (iii)) (For spouse: See Section 4.4.6) (Non-significant/inconclusive: See Sections 4.1.1, 4.4.3 and 4.4.5) (See Section 4.2.5 and Section 4.3 (iii))

Question 1.5	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I feel confident that insurance companies offering guaranteed annuities will survive over the long term. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *Purchasing a guaranteed annuity from only one insurance company is risky, as that company could become insolvent.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Default risk HE1&2: Individuals who are more concerned that life insurance companies might not survive over the long term are less likely to annuitise. OR HE1&2: Individuals who are more concerned that life insurance companies might not survive over the long term are more likely to annuitise. VUAP1: Whether individuals think life insurance companies will survive over the long term. VUAP2: Whether individuals think that purchasing a guaranteed annuity from only one insurance company exposes them to diversification risk, should any specific company become insolvent. R1&2: Individuals may fear that life insurance companies that do not survive over the long term could default on guaranteed annuity payments (e.g. in the event of the pool of life annuitants living longer than expected). OR R1&2: Individuals influenced by such an unlikely event as insurance companies defaulting on guaranteed annuity income payments, may be regarded as highly risk-averse and may therefore favour annuitisation due to the protection it offers against longevity and investment risks. Similarly individuals who think such an event is highly unlikely present risk seeking behaviour, and may thus be less prone to annuitisation. (See Section 4.2.6)
Question 1.6	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
A living annuity is desirable as it allows me access to my retirement capital to pay for unforeseen expenses – for example medical costs or home repairs. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is important to have access to cash during retirement for emergencies.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Access HE1 & H2: Individuals who have liquidity constraints, will prefer self-annuitisation. VUAP1&2: Need for liquidity R1&2: Living annuitants have greater access to retirement capital to pay for unforeseen expenses, as they can choose a withdrawal rate each year subject to a minimum of 2.5% and a maximum of 17.5% of the underlying balance in a living annuity account. (See Section 4.2.4 and Section 4.3 (v))

Question 1.7	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I prefer investments that offer high returns, even if it is a risky decision. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I try to avoid financial risk.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Risk aversion HE1&2: Stronger risk aversion reduces the propensity to self-annuitise. VUAP1: Investment risk/return trade-off VUAP2: Self-reported financial risk aversion R1-2: Individuals who are more risk averse are more likely to annuitise, as they value the longevity and investment risk protection offered by guaranteed annuities. (See Sections 4.4.1, 4.4.5, 4.4.6; Non-significant: Section 4.4.3.)
Question 1.8	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I would probably live long enough for a guaranteed annuity to be worthwhile. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I fear dying soon after retirement.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I fear outliving my retirement capital.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Mortality risk/Early death HE1: Individuals with high mortality risk are less likely to annuitise. HE2: Individuals who fear dying soon after retirement are less likely to choose a guaranteed annuity. (Also indication that investors overweighing the probability of near periods as explained in risk-order bias.) HE3: Individuals who fear outliving their retirement capital, are more likely to annuitise. HE4-6: Higher mortality risk relates to self-annuitisation. HE7: Individuals who are uncertain about their length of life are less likely to annuitise. (Loss aversion increases with an increase in uncertainty about length-of-life). VUAP1: Whether individuals think they will live long enough to benefit from annuitisation. VUAP2: Fear of dying soon after retirement VUAP3: Fear of outliving retirement capital VUAP4-6: Subjective survival probability VUAP7: Uncertainty about survival prospects at retirement R1: Individuals who die soon after retirement will be better off buying a living annuity, as they will earn a higher return on their investment and have greater access to money for health or other unforeseen expenses. R2: Life annuitants lose their retirement capital at death (except where another life is added onto the policy or a guarantee term applies). Living annuitants on the other hand can bequeath the remaining capital in their living annuity accounts to heirs at death.

It is likely that I survive to age 75. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS) *It is likely that I survive to age 85.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS) *It is likely that I survive to age 90 and beyond.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS) *I am uncertain about my own biological survival prospects at retirement.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	R3: Living annuitants bear the risk of outliving their retirement capital as their funds may become depleted. R4-6: Individuals with long life expectancies have more to benefit from annuitisation as they can expect more pension income payments. R7: Individuals who have less certainty about their own survival prospects at retirement, have less to benefit from annuitisation as they have no certainty about the amount of pension income payments they will receive from a guaranteed annuity. (See Section 4.3 (ii) and Sections 4.4.1, 4.4.2, 4.4.3 and 4.4.4 as they relate to health) Mortality risk, as it relates to health, is non-significant in Inkmann et al. (2011) (See Section 4.4.6) (Also see Section 3.4.4 and Section 4.2.10 for a discussion on risk-order bias) (See also loss aversion in Section 3.4.1)

Question 1.9	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Financial advisors selling guaranteed annuities pursue only their own self-interested goals. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *Financial advisors selling living annuities pursue only their own self-interested goals.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I believe that financial advisors selling guaranteed annuities have their clients' best interests at heart.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I believe that financial advisors selling living annuities have their clients' best interests at heart.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Trust in financial advisors HE1: Individuals who think that financial advisors selling guaranteed annuities pursue only their self-interested goals are less likely to annuitise. HE2: Individuals who think that financial advisors selling living annuities pursue only their self-interested goals are less likely to self-annuitise. HE3: Individuals who believe that financial advisors selling guaranteed annuities have their clients' best interests at heart, are more likely to annuitise. HE4: Individuals who believe that financial advisors selling living annuities have their clients' best interests at heart, are more likely to self-annuitise. VUAP1: Whether individuals think that financial advisors selling guaranteed annuities pursue only their self-interested goals. VUAP2: Whether individuals think that financial advisors selling living annuities pursue only their self-interested goals. VUAP3: Whether individuals believe that financial advisors selling guaranteed annuities have their clients' best interests at heart. VUAP4: Whether individuals believe that financial advisors selling living annuities have their clients' best interests at heart. R1&3: Financial advisors selling guaranteed annuities earn commission when they sell guaranteed annuities. R2&4: Financial advisors selling living annuities earn an ongoing fee, as a percentage of the underlying investment amount. (See Section 2.3.1) (Exploratory)

Question 1.10	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
A guaranteed annuity makes me think about my own death. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *A living annuity makes me think about my own death.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Mortality salience HE1: If a guaranteed annuity makes individuals think about their own death, they may be less likely to annuitise. HE2: If a living annuity makes individuals think about their own death, they may be less likely to self-annuitise. VUAP1: Whether a guaranteed annuity makes individuals think about their own death. VUAP2: Whether a living annuity makes individuals think about their own death. R1: Guaranteed annuity income payments cease at death. R2: The remaining capital of an individual's living annuity account may be bequeathed to heirs and therefore keeps on living. (See Section 3.4.5 and Section 4.2.10)
Question 1.11	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I am familiar with retirement income options. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I educate myself on retirement income options.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I have consulted with a financial advisor about retirement income options.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Awareness (*Consumer awareness and education could be an indicator of financial literacy.*) HE: Individuals who are more familiar with annuity income products are more likely to annuitise. VUAP1: Familiarity with retirement income options. VUAP2: Active self-education on retirement income options. VUAP3: Consultations with a financial advisor about retirement income options. R1-3: Individuals who are familiar with retirement income options, and actively educate themselves, as well as consult with professionals regarding such options, are more likely to choose an annuity that will protect them against longevity and investment risks in retirement. In addition, they are in a better position to weigh the benefits and disadvantages of annuitisation versus self-annuitisation. (See Section 4.2.9)

Question 1.12	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I regard myself as someone who is patient. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I make financial planning decisions quickly.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Patience HE1&2: Less patient individuals have a higher propensity to self-annuitise. VUAP1: Self-reported general level of impatience VUAP2: Speed of financial decision-making R1&2: Individuals who are impatient and who usually make financial decisions quickly, are less likely to annuitise, as it requires some patience in waiting for each guaranteed annuity payment. With a living annuity, however, individuals are allowed to withdraw larger amounts in any given year. (See Sections 4.4.1, 4.4.2, 4.4.3 and 4.4.4) Note: The HRS uses the time horizon for financial decisions (also referred to as time rate of preference or time rate of discount) as a measure of patience. The measures used in this study to capture patience therefore differ from the measure used by the HRS. Hence, there would appear to be limitations in comparing the results of this study with other similar studies based on HRS data.
Question 1.13	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
It makes sense to invest money in the shares of more than one company. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from SHIW) *Investing in retirement funds has the same tax advantages as other investment funds. / All retirement funds guarantee to pay retirees a pension until their death. / Pension fund law prohibits retirement funds to invest in shares.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from SHIW)	D: Financial literacy HE: Higher financial literacy may relate to higher levels of annuitisation. VUAP1: Knowledge of diversification. (In Cappelletti et al. (2013) people who have knowledge of diversification annuitise significantly less.) VUAP2: Pension literacy. (Significant positive correlation with annuitisation in Cappelletti et al. (2013)) R1-2: Understanding pension and other financial matters could encourage annuitisation, as individuals may understand the benefits of annuitisation better. However, individuals with investment knowledge may think that they could earn superior rates of return by rather investing the money themselves in a living annuity product. (See Section 4.4.3) Note: The questions used to measure financial literacy were derived from the questions used by the SHIW to measure financial literacy. The measures used in this study to capture financial literacy therefore differ from the measures used by the SHIW. Hence, there would appear to be limitations in comparing the results of this study with other similar studies based on SHIW data.

Question 1.14	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I prefer to know exactly what my future income stream will be. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I prefer a guaranteed annuity that runs automatically and that requires no further decision-making from me.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I prefer a guaranteed income stream for life.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Certainty HE1: Individuals who prefer to know exactly what their income stream will be in advance, will be more likely to annuitise. HE2: Individuals who prefer their income stream to run automatically without further decision-making from them will be more likely to annuitise. HE3: Individuals who prefer a guaranteed income stream for life, are more likely to choose the annuitisation route. VUAP1: Knowing in advance what income stream will be VUAP2: Preference for annuity income that runs automatically with no other interference from annuitant VUAP3: Preference for a guaranteed income stream for life R1: Guaranteed annuities provide a pre-determined income stream for life. R2: Guaranteed annuities provide a pre-determined income stream for life and require no further decision-making from annuitant. R3: Individuals may prefer a guaranteed income to a flexible income stream that is dependent on volatile and unpredictable investment returns. (See Section 2.4.1) (Exploratory)
Question 1.15	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
A guaranteed annuity will give me peace of mind. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *A living annuity will give me peace of mind.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Benefit perception HE1: Individuals who think that a guaranteed annuity will give them peace of mind, financial security and fair return on investment, are more likely to annuitise. HE2: Individuals who think that a living annuity will give them peace of mind, financial security and a fair return on investment, are more likely to self-annuitise. VUAP1: Benefit perceptions of guaranteed annuity. VUAP2: Benefit perceptions of living annuity. R1: Individuals who perceive guaranteed annuities as favourable, will be more likely to annuitise, as they value the protection against longevity and investment risk. R2: Individuals who perceive living annuities as favourable, will be more likely to self-annuitise, as they are willing to personally bear longevity and investment risk in the search of generating higher returns. In addition, it may give living annuitants peace of mind to know that their capital will not be lost in the event of early death. (See Section 5.5.1) (Exploratory)

A guaranteed annuity will give me financial security. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *A living annuity will give me financial security.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *A guaranteed annuity will give me a fair return on my investment.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *A living annuity will give me a fair return on my investment.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	

Question 2	
Question 2.1	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I buy and sell shares on the share market in my personal capacity. • Yes • No • N/A (Derived from SHIW)	D: Share market participation HE1: Share market participation increases the propensity to self-annuitise. VUAP1: Participation in share market in personal capacity R1: Individuals who participate in the share market in their personal capacities may be more inclined towards self-annuitisation, as they have a greater affinity towards investments. (See Section 4.4.3) Opposite effect: Inkmann et al. (2011) (See Section 4.4.6)
Question 2.2	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I have a life insurance policy, which I intend to keep in force until death. • Yes • No • N/A *I intend to keep the death benefits provided by my employer's group life scheme in place after retirement.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from ELSA)	D: Life insurance holdings HE1: Intention to keep life insurance policy until death will increase annuitisation. HE2: Intention to convert group life cover to individual policy at retirement will increase annuitisation. VUAP1: Intention to keep life insurance policy until death. VUAP2: Intention to convert group life cover to individual policy at retirement. R1-2: If an individual intends to keep his/her life insurance policy (or policies) or convert his/her group life cover to an individual policy, he/she might be more likely to choose a guaranteed annuity, as a lump sum amount will become payable on death. (See Section 4.4.6)
Question 2.3	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I am a member of a medical aid scheme. • Yes • No • N/A (Derived from HRS) *I have health insurance, for example, gap cover, disability or critical illness insurance.* • Yes • No • N/A (Derived from HRS)	D: Medical cover HE1: Individuals with medical aid membership are less likely to self-annuitise. HE2: Individuals with health insurance are less likely to self-annuitise. VUAP1: Medical aid membership VUAP2: Health insurance coverage R1&2: Individuals who have resources from which they can pay for unforeseen medical expenses are less likely to have a precautionary savings motive, and therefore are less prone to self-annuitise. (See Section 4.2.4 and Section 4.3 (v))

Question 3: Demographic characteristics[274]	
Question 3.1	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
How old are you? ...	D: Age HE: Younger cohorts are more likely to annuitise. VUAP: Age R: Individuals with longer life expectancies can benefit more from annuitisation, as they are likely to receive more income payments. (See Section 4.4.1; Non-significant: See Section 4.4.3) (Opposite effect: See Section 4.4.4.)
Question 3.2	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
How many years do you have left before you reach retirement?...	D: Years before retirement HE: Individuals with many years before retirement may underestimate the benefits provided by guaranteed annuities. VUAP: Years left before retirement R: Individuals with many years before retirement may not have given the risks they face in retirement much thought. (Exploratory)
Question 3.3	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
How many people do you support financially (excluding yourself)?[275]	D: Support HE: The larger the number of people an individual supports financially, the less likely he/she is to annuitise. VUAP: Number of people that individual supports financially R: The remaining balance in a living annuity can be passed on to heirs as an inheritance at death. Also, bigger households may have a bigger need for liquid and accessible resources. (See Section 4.2.1 and Section 4.4.2) (To spouse: See Section 4.4.6) (Non-significant/inconclusive: See Sections 4.4.1, 4.4.3 and 4.4.5)

[274] Derived from HRS and SHIW.

[275] Usually referred to as household size.

Question 3.4	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
How many children (including grandchildren) do you have?...	D: Children HE: Individuals who have a bequest motive will be less likely to annuitise. VUAP: Number of children, including grandchildren R: The remaining balance in a living annuity can be passed on to heirs as an inheritance at death. (See Section 4.2.1 and Section 4.4.2) (To spouse: See Section 4.4.6) (Non-significant/inconclusive: See Sections 4.4.1, 4.4.3 and 4.4.5)
Question 3.5	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Gender: • Male • Female • Prefer not to say	D: Gender HE: Women have a higher propensity to annuitise. VUAP: Gender R: As women have longer life expectancies than males, they may prefer annuitisation since they could expect more income payments. (See Sections 4.4.4 and 4.4.5) (Non-significant: See Sections 4.4.1 and 4.4.3)
Question 3.6	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Relationship status: • Single • Married • Co-habiting • Widowed • Separated/divorced	D: Relation HE: Married individuals are less likely to annuitise. VUAP: Relationship status R: Married individuals (due to risk-sharing between couples) have the capacity to pool mortality risk and therefore value annuitisation less than individuals who are not married. (See Sections 4.4.1, 4.4.4, 4.4.5[276] and 4.4.6) (Non-significant: Section 4.4.3) (Opposite effect for married females: See Section 4.4.5.)
Question 3.7	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Health status: • Excellent • Very good • Good • Fair • Poor	D: Health HE: Individuals in poor health are less likely to annuitise. VUAP: Self-reported health status R: Individuals in poor health may not receive enough income payments from a guaranteed annuity to make it worthwhile. (See Sections 4.4.1, 4.4.2, 4.4.3, and 4.4.4) (Non-significant in Inkmann et al. (2011). See Section 4.4.6)

[276] For married males only.

Question 3.8	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Highest qualification completed: • Lower than Grade 12/matric • Grade 12/matric • Degree/diploma/certificate • Postgraduate degree	D: Qualification HE: Individuals with a higher qualification obtained are more likely to annuitise. VUAP: Level of formal education. In Cappelletti et al. (2013) people with a higher level of education had a significantly higher propensity to annuitise. R: People with a higher level of education, have a better understanding of the benefits of annuitisation. (See Sections 4.4.2, 4.4.3, 4.4.4[277] and 4.4.6.) (Non-significant in Brown (2001). See Section 4.4.1)
Question 3.9	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Which of the following best describes your socio-economic status? • Low income • Lower middle income • Higher middle income • High income	D: Socio-economic status HE: Individuals with a lower socio-economic status are less likely to annuitise. R: Poorer individuals are more likely to go the living annuity route, in order to gain access to their retirement money in order to meet liquidity requirements. (See Sections 4.4.2, 4.4.3, 4.4.4, 4.4.5 and 4.4.6) (Opposite effect: See Section 4.4.1)

[277] Non-significant.

Table B.4: Part 2: Satisfaction levels as they relate to annuity choice

Question 1	
Question 1.1	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I can withdraw above-average income from a living annuity each year. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I do better by investing my retirement capital in a living annuity, because my capital has the potential to grow.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Investor confidence/Higher returns HE1&2: Living annuitants who think they can earn above-average income, as well as generate capital growth from a living annuity, have high confidence levels in their own investment skills and/or the investment skills of financial advisors and will experience high satisfaction in retirement. (This could be as a result of annuitants viewing living annuities through the investment frame). VUAP1&2: Investor confidence R1-2: Individuals with investment skills, or individuals who have access to such skills, can invest their retirement monies in a variety of asset classes, for example equities, and could potentially earn superior rates of return. If the underlying investment portfolio generates a good return, living annuitants are able to withdraw annuity income in excess of what a guaranteed annuity could provide. In comparison, in order to cover their liabilities towards life annuitants, life insurers are limited in terms of investable asset classes. (See Section 4.4.2 (ii) and Section 4.3 (vi)) (Also indication that investors view annuities using an investment frame. See Section 3.4.3 and Section 4.2.10) (Exploratory)
Question 1.2	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I like the flexibility and control of managing a living annuity. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is important to choose the amount of income I receive in retirement each year.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Flexibility HE: Living annuitants who prefer flexibility and control are more satisfied in retirement. VUAP1: Desire for flexibility and control of retirement capital VUAP2: The importance to choose the amount of income in retirement each year VUAP3: The importance to choose the financial advisor that manages retirement capital VUAP4: The importance to annuitants to choose underlying investments themselves R: Living annuities allow for more flexibility and control in terms of, among others, underlying investments and withdrawals. (See Section 4.2.8 and Section 4.4.2) (Exploratory)

It is important to choose the financial advisor who manages the underlying investments of my capital in retirement. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is important to choose the underlying investments of my capital in retirement myself.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	
Question 1.3	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
At death, it is important to me to leave my remaining retirement capital to my heirs. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *My family would fund any shortfall I might have in retirement, in return for inheriting any money left in my living annuity.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is important to me to leave an inheritance to my heirs at death.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Bequest HE1-3: Living annuitants who have a bequest motive with respect to their retirement capital will be more satisfied. VUAP1: Remaining capital to heirs VUAP2: Risk-sharing within families VUAP3: Leaving bequest to heirs at death R1: The remaining balance in a living annuity can be passed on to heirs as an inheritance at death. R2: Individuals, who privately pool longevity risk, have no need to insure this risk in the commercial market. R3: Individuals who have a strong desire to leave their assets to heirs at death, will appreciate that they could leave the remaining balance in a living annuity to heirs as an inheritance at death. (See Section 4.2.1 and Section 4.4) (See Section 4.2.5 and Section 4.3 (iii)) (Exploratory)

Question 1.4	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
A living annuity is desirable as it allows me access to my retirement capital to pay for unforeseen expenses – for example medical costs or home repairs. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is important to have access to cash during retirement for emergencies.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Access HE1 & H2: Living annuitants who desire accessibility are more satisfied. VUAP1&2: Need for liquidity R1&2: Living annuitants have greater access to retirement capital to pay for unforeseen expenses, as they can choose a withdrawal rate each year subject to a minimum of 2.5% and a maximum of 17.5% of the underlying balance in a living annuity account. (See Section 4.2.4 and Section 4.3 (v)) (Exploratory)
Question 1.5	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I prefer investments that offer high returns, even if it is a risky decision. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I try to avoid financial risk.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Risk aversion HE1&2: Stronger risk aversion relates to more satisfaction. VUAP1: Investment risk/return trade-off VUAP2: Self-reported financial risk aversion R1-2: Individuals who are more risk averse are more likely to have planned sufficiently for retirement. (See Section 4.6)

Question 1.6	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I would probably live long enough for a guaranteed annuity to be worthwhile. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I fear dying soon.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I fear outliving my retirement capital.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *It is likely that I survive to age 85.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS) *It is likely that I survive to age 90 and beyond.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Mortality risk/Early death HE1-7: Retirees with high mortality risk are less satisfied. VUAP1: Whether individuals think they will live long enough to benefit from annuitisation. VUAP2: Fear of dying soon after retirement VUAP3: Fear of outliving retirement capital VUAP4-6: Subjective survival probability VUAP7: Uncertainty about survival prospects at retirement R1-7: Retirees in good health have a higher quality of life. (See Section 4.6)

I am uncertain about my own biological survival prospects. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	
Question 1.7	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Financial advisors selling living annuities pursue only their own self-interested goals. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I believe that financial advisors selling living annuities have their clients' best interests at heart.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Trust in financial advisor selling living annuities HE1: Living annuitants who think that financial advisors selling living annuities pursue only their self-interested goals are less satisfied. HE2: Living annuitants who believe that financial advisors selling living annuities have their clients' best interests at heart, are more satisfied. VUAP1: Whether individuals think that financial advisors selling living annuities pursue only their self-interested goals. VUAP2: Whether individuals believe that financial advisors selling living annuities have their clients' best interests at heart. R1&2: Financial advisors selling living annuities earn an ongoing fee, as a percentage of the underlying investment amount. (See Section 2.3.1) (Exploratory)
Question 1.8	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
A living annuity makes me think about my own death. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Mortality salience HE: If a living annuity makes living annuitants think about their own death, they will be less satisfied. VUAP: Whether a living annuity makes individuals think about their own death. R: The remaining capital of an individual's living annuity account may be bequeathed to heirs and therefore keeps on living. (See Section 3.4.5 and Section 4.2.10) (Exploratory)

Question 1.9	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I am familiar with retirement income options. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I educate myself on retirement income options.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I consult with a financial advisor about retirement income options.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I am familiar with a guaranteed annuity as a retirement income option.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I am familiar with a living annuity as a retirement income option.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Awareness (*Consumer awareness and education could be an indicator of financial literacy.*) HE: An increase in a retiree's awareness of annuity income products will increase satisfaction. VUAP1: Familiarity with retirement income options. VUAP2: Active self-education on retirement income options. VUAP3: Consultations with a financial advisor about retirement income options. VUAP4: Familiarity with a guaranteed annuity VUAP5: Familiarity with a living annuity R1-5: Retirees who are familiar with retirement income options, and actively educate themselves, as well as consult with professionals regarding such options, take ownership of their future financial wellbeing. (See Section 4.6)

Question 1.10	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I regard myself as someone who is patient. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *I make financial planning decisions quickly.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from HRS)	D: Patience HE1&2: Less patient retirees are less satisfied. VUAP1: Self-reported general level of impatience VUAP2: Speed of financial decision-making R1&2: Retirees who are impatient and who usually make financial decisions quickly, are more likely to regret hasty decisions. (See Section 4.4) (Exploratory) Note: The HRS uses the time horizon for financial decisions (also referred to as time rate of preference or time rate of discount) as a measure of patience. The measures used in this study to capture patience therefore differ from the measure used by the HRS. Hence, there would appear to be limitations in comparing the results of this study with other similar studies based on HRS data.
Question 1.11	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
It makes sense to invest money in the shares of more than one company. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from SHIW) *Investing in retirement funds has the same tax advantages as other investment funds. / All retirement funds guarantee to pay retirees a pension until their death. / Pension fund law prohibits retirement funds to invest in shares.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree (Derived from SHIW)	D: Financial literacy HE: Higher financial literacy may be associated with higher satisfaction. VUAP1: Knowledge of diversification. VUAP2: Pension literacy. R1-2: Retirees who understand pension and other financial matters will make sure their financial future is secure. (See Section 4.6) Note: The questions used to measure financial literacy were derived from the questions used by the SHIW to measure financial literacy. The measures used in this study to capture financial literacy therefore differ from the measures used by the SHIW. Hence, there would appear to be limitations in comparing the results of this study with other similar studies based on SHIW data.

Question 1.12	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
The retirement income option I have chosen gives me peace of mind. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *A retirement income option I have chosen gives me a fair return on my investment.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *The retirement income option I have chosen gives me a sense of financial security.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Post-retirement benefit perception HE: Living annuitants who think that a living annuity gives them peace of mind, financial security and a fair return on investment, will be more satisfied. VUAP: Benefit perceptions of living annuity R: Living annuitants may value the peace of mind to know that their capital will not be lost in the event of early death. (See Section 5.5.1) (Exploratory)

Question 1.13	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Most people I ask recommend a living annuity. • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *My financial advisor recommends a living annuity.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree *A living annuity, as far as I know, is the most popular retirement income option.* • Strongly disagree • Disagree • Somewhat disagree • Neither agree nor disagree • Somewhat agree • Agree • Strongly agree	D: Influence HE: Individuals who think that a living annuity conforms to what most people think is beneficial, will be more satisfied. VUAP1: What most people recommend VUAP2: What financial advisors recommend VUAP3: The most popular option R1-3: Individuals are influenced by the AIP(s) their financial advisors recommend, as well as the decisions other people make. (This could be attributed to the influence of societal thinking, where people consider others' actions before they make a decision. See Section 3.6.) (See also Section 2.3.1) (Exploratory)

Question 2	
Question 2.1	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I buy and sell shares on the share market in my personal capacity. • Yes • No • N/A (Derived from SHIW)	D: Share market participation HE1: Share market participation increases satisfaction VUAP1&2: Participation in share market in personal capacity. R1&2: Individuals who participate in the share market in their personal capacities are likely to be financially savvy. (See Section 4.4) (Exploratory)
Question 2.2	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I have a life insurance policy (or policies), which I intend to keep in force until death. • Yes • No • N/A *I have kept the death benefits provided by my employer's group life scheme in place after retirement.* • Yes • No • N/A (Derived from ELSA)	D: Life insurance holdings HE1: Intention to keep life insurance policy (or policies) until death will increase satisfaction. HE2: Intention to convert group life cover to individual policy at retirement will increase satisfaction. VUAP1: Intention to keep life insurance policy (or policies) until death. VUAP2: Whether group life cover was converted to an individual policy at retirement. R1-2: If an individual intends to keep his/her life insurance policy (or policies), or has converted his/her group life cover to an individual policy, a lump sum amount will become payable on death. (See Section 4.6)
Question 2.3	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I am a member of a medical aid scheme. • Yes • No • N/A (Derived from HRS) *I have health insurance, for example, gap cover, disability or critical illness insurance.* • Yes • No • N/A (Derived from HRS)	D: Medical cover HE1: Retirees with medical aid membership are more satisfied. HE2: Retirees with health insurance are more satisfied. VUAP1: Medical aid membership VUAP2: Health insurance coverage R1&2: Individuals who have resources from which they can pay for unforeseen medical expenses enjoy financial security. (See Section 4.6)

Question 2.4	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
I receive income from other assets, apart from my pension income.[278] • Yes • No • N/A *I continue to work in retirement for remuneration.*[279] • Yes • No • N/A (Derived from Gardner & Wadsworth, 2004)	D: Other income during retirement HE1: Retirees who receive income from sources outside of their annuity income are more satisfied. HE2: Retirees who work in retirement are more satisfied. VUAP1: Income, apart from annuity income. VUAP2: Work status in retirement R1: Individuals who have other sources of income from alternative assets may be less concerned with outliving retirement capital and taking on investment risk in a living annuity product. (Exploratory) R2: Individuals who keep on working for remuneration in retirement may feel economically relevant. (See Section 4.2.8 and Section 4.4.2)
Question 3: Demographic characteristics[280]	
Question 3.1	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
How old are you? ...	D: Age HE: Older retirees are happier. VUAP: Age R: Older individuals may have adapted to being retired. (See Section 4.6)
Question 3.2	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
How many years have you been retired?...	D: Years retired HE: Retirees whom have been retired for many years are happier. VUAP: Years retired R: Older individuals may have adapted to being retired. (See Section 4.6)

[278] This question is not included in Part 1, as respondents will not yet have certainty regarding income from other assets in retirement. This question has not been asked explicitly in previous questionnaires.

[279] This question is not included in Part 1, as respondents will not yet know if they will work in retirement. This question is derived from the questionnaire used in Gardner and Wadsworth (2004).

[280] Derived from HRS and SHIW.

Question 3.3	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
How many people do you support financially (excluding yourself)?[281]	D: Support HE: The larger the number of people an individual supports financially, the less satisfied he/she will be. VUAP: Number of people that individual supports financially R: More financial dependants may translate into more claims on retirement assets. (See Section 4.4) (Exploratory)
Question 3.4	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
How many children (including grandchildren) do you have?...	D: Children HE: Retirees who have a bequest motive will be more satisfied. VUAP: Number of children, including grandchildren R: The remaining balance in a living annuity can be passed on to heirs as an inheritance at death. (See Section 4.4) (Exploratory)
Question 3.5	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Gender: • Male • Female • Prefer not to say	D: Gender HE: Men are happier in retirement. VUAP: Gender R: In Panis (2004) women experienced more depression symptoms than their male counterparts. (See Section 4.6)
Question 3.6	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Relationship status: • Single • Married • Co-habiting • Widowed • Separated/divorced	D: Relation HE: Married retirees are happier. VUAP: Relationship status R: Married individuals are less likely to be lonely. (See Section 4.6)
Question 3.7	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Health status: • Excellent • Very good • Good • Fair • Poor	D: Health HE: Individuals in poor health are less happy. VUAP: Self-reported health status R: Retirees who are ill have a lower quality of life. (See Section 4.6)

[281] Usually referred to as household size.

Question 3.8	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Highest qualification completed: • Lower than Grade 12/matric • Grade 12/matric • Degree/diploma/certificate • Postgraduate degree	D: Qualification HE: Individuals with a higher qualification obtained are happier. VUAP: Level of formal education. R: People with a higher level of education have a better understanding of their retirement benefits. (See Section 4.6)
Question 3.9	**Determinant(s) (D), hypothesised effect(s) (HE), variable(s) used as proxy (VUAP), rationale(s) (R)**
Which of the following best describes your socio-economic status? • Low income • Lower middle income • Higher middle income • High income	D: Socio-economic status HE: Individuals with a lower socio-economic status are less happy. R: Poorer individuals are more financially strained and may have to reduce their living standard. (See Section 4.6)

APPENDIX C:
QUESTIONNAIRES IN MS WORD

This appendix includes the surveys on retirement options.

In each of the questionnaires for Part 1 and Part 2 of the study, respondents were instructed to hover or click on any underlined terms, if they were unsure of the meaning. A screen would then pop up with a definition of the particular term.

For the sake of visibility, these terms are not underlined in the MS Word version of the questionnaires in this dissertation, but the definitions that respondents could access, are included below.

- Death benefits: A sum of money that pays out at death.
- Group life scheme: A scheme to which employees automatically belong by virtue of their employment.
- Health insurance: A short-term insurance product that pays you (the insured) a sum of money for specified medical conditions.
- Heir(s): Person(s) who will inherit from you.
- Income stream: A series of future income payments.
- Investments: Unit trust funds consisting of shares, bonds, property and cash.
- Guaranteed annuity: A guaranteed income stream for life.
- Life insurance policy: A contract between you and an insurer, whereby the insurer promises to pay you (the insured) a sum of money in exchange for a premium, upon your death.
- Living annuity: A flexible income stream that is **not** guaranteed for life.
- Medical aid scheme: A scheme that covers its members for expenses associated with receiving medical treatment.
- Original investment: Your retirement capital paid over to the life insurer.
- Retirement capital: Your retirement savings or “nest-egg”.
- State-funded pension: Social old age grant.

UNIVERSITEIT STELLENBOSCH UNIVERSITY

SURVEY ON RETIREMENT INCOME OPTIONS

PART 1

CONSENT TO PARTICIPATE IN RESEARCH

Dear employee,

You are invited to take part in a survey regarding employees' perceptions and potential future decision-making with respect to their choice of a retirement income option.

Kindly take note:

- The results of this research study being conducted by the **Department of Business Management**, **Stellenbosch University**, will contribute to the researcher, Mrs Jeannie de Villiers-Strijdom, in completing her PhD.
- The necessary **ethical clearance** to conduct the study was obtained from: 1) the Departmental Ethics Screening Committee (DESC), 2) the Research Ethics Committee (REC) (approval number 9101), and 3) the Division for Information Governance (approval number IRPSD1251).
- Your participation is **voluntary**, and you are free to withdraw from the study at any stage.
- The questionnaire will take about **10 minutes to complete**, and will contain questions covering, among others, the factors that may influence your investment decisions.
- The questionnaire will be completed **anonymously**, thereby ensuring **confidentiality**. The researcher will not have access to any participant's identifiers.
- Findings from the research will be **published** and will be available in the public domain.

RIGHTS OF RESEARCH PARTICIPANTS

You have the right to decline answering any specific question, and you can exit the survey at any time without giving a reason. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions about your rights as a research participant, contact Mrs Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development, Stellenbosch University.

If you have any questions or concerns about the research, please feel free to contact the researcher, Mrs Jeannie de Villiers-Strijdom [jeannie@sun.ac.za; 083 318 1780], or her supervisors, Prof Niel Krige [jdkrige@sun.ac.za] and Prof Johann de Villiers [judv@sun.ac.za].

Should you wish to keep a copy of the consent page, take a screenshot of this display and save it to your device. In order to proceed, please tick **BOTH** boxes.

I confirm that I have read and understand the information on this consent page.	
I agree to take part in this survey.	

INTRODUCTION

Please read all the introductory information carefully before you answer the questions.

IMPORTANT! If you are unsure of the meaning of any highlighted term, a short definition is available in the commentary box.

We are interested in your perceptions, understanding and potential future decision-making with respect to your choice of a retirement income option.

When you retire from your employer's retirement fund, you are required to convert your retirement capital into an income stream. You will have to make a choice between two retirement income options, namely, either a ***living*** **annuity (OPTION 1)** or a ***guaranteed*** **annuity (OPTION 2)**.

Your two retirement income options are summarised as follows:

OPTION 1: *Living* annuity

- Invest your retirement capital into a product called a ***living*** **annuity**, where you choose the underlying investments. When choosing this option, you may withdraw pension income every year, subject to a minimum withdrawal rate of **2.5%** and a maximum withdrawal rate of **17.5%** of the total investment amount. *You may therefore choose the amount of income you receive each year, subject to the annual limits.*
- If the pension income you withdraw from your ***living*** **annuity** consistently **exceeds** the growth on your investment portfolio, the total investment amount could eventually become **DEPLETED** if you select this option. *You **CAN** therefore outlive your retirement capital.*
- If you have money left over in your ***living*** **annuity** when you die, it could be left to your heirs as an inheritance. In other words, with a ***living*** **annuity**, your remaining capital keeps on ***living***.

OPTION 2: Guaranteed annuity

- The alternative option is to use your retirement capital to purchase an **insurance product**, called a ***guaranteed*** **annuity,** which **GUARANTEES** to pay you a **predetermined** pension income each year for the rest of your ***life***. *You therefore **CANNOT** outlive your retirement capital.*
- You have the choice of choosing either a pension that stays the same each year or a pension that escalates with a certain rate, e.g. the inflation rate, each year.
- If you live sufficiently long after retirement, the total amount of pension income you receive from your ***guaranteed*** **annuity** may **exceed** your original investment. However, if you die soon after retirement, you will receive in total **less** than what you have paid. In other words, a ***guaranteed*** **annuity** dies with you, and NO remaining capital can be left to your heirs. Put differently, a ***guaranteed*** **annuity** ends with your ***life.***

SECTION A:

Let's assume that you are now approaching retirement, and must convert your retirement capital from your employer's retirement fund into an income stream.

There are no correct or incorrect responses to the statements in this section. Describe your perceptions as accurately as possible by ticking one of the seven response options. For each statement, tick the response option that best describes your point of view. If you are unable to respond to a question, please tick number 4.

In your responses, please assume that you have no other sources of income or wealth to supplement your retirement income and that you do not qualify for a state-funded pension.

Please insert an 'X' in the chosen box.

		Strongly Disagree						**Strongly Agree**
		1	**2**	**3**	**4**	**5**	**6**	**7**
1.	I could withdraw sufficient income from a ***guaranteed*** **annuity** each year.							
2.	I could withdraw above-average income from a ***living*** **annuity** each year.							
3.	I would probably do better by investing my retirement capital in a ***living*** **annuity**, because my capital would have the potential to grow.							
4.	I prefer a guaranteed income stream for ***life***.							
5.	I like the flexibility and control of managing a ***living*** **annuity**.							
6.	I prefer to know exactly what my future income stream will be.							
7.	I prefer a ***guaranteed*** **annuity** that runs automatically and that requires no further decision-making from me.							
8.	At death, it is important to me to leave my remaining retirement capital to my heirs.							
9.	I feel confident that insurance companies offering ***guaranteed*** **annuities** will survive over the long term.							
10.	A ***living*** **annuity** is desirable as it allows me access to my retirement capital to pay for unforeseen expenses – for example, medical costs or home repairs.							
11.	A ***guaranteed*** **annuity** will give me peace of mind.							
12.	A ***living*** **annuity** will give me peace of mind.							
13.	My family would fund any shortfall I might have in retirement, in return for inheriting any money left over in my ***living*** **annuity**.							
14.	It is unfair that insurance companies offering ***guaranteed*** **annuities** keep the excess funds at the annuitant's death.							
15.	It makes sense to exchange my retirement capital for a guaranteed income stream for ***life***.							

16.	I would probably live long enough for a ***guaranteed* annuity** to be worthwhile.							
17.	Purchasing a ***guaranteed* annuity** from only one insurance company is risky, as that company could become insolvent.							
18.	A ***guaranteed* annuity** will ensure me a fair return on my investment.							
19.	A ***living* annuity** will ensure me a fair return on my investment.							
20.	Financial advisors selling ***guaranteed* annuities** pursue only their own self-interested goals.							
21.	Financial advisors selling ***living* annuities** pursue only their own self-interested goals.							
22.	A ***guaranteed* annuity** will give me financial security.							
23.	A ***living* annuity** will give me financial security.							
24.	I believe that financial advisors selling ***guaranteed* annuities** have their clients' best interests at heart.							
25.	I believe that financial advisors selling ***living* annuities** have their clients' best interests at heart.							
26.	It would be important to choose the amount of income I receive in retirement each year.							
27.	It would be important to choose the financial advisor who manages the underlying investments of my capital in retirement.							
28.	It would be important to choose the underlying investments of my capital in retirement myself.							
29.	A ***guaranteed* annuity** makes me think about my own death.							
30.	A ***living* annuity** makes me think about my own death.							
31.	I fear outliving my retirement capital.							

SECTION B:

For the purposes of this survey, you must now choose between a ***living*** **annuity (OPTION 1)** and a ***guaranteed*** **annuity (OPTION 2)**.

A quick reminder of what the two options entail:

OPTION 1: L*iving* annuity

- You choose the underlying investments and the amount of pension income you receive each year, subject to a minimum and maximum withdrawal rate.
- You CAN outlive your retirement capital.
- If you have money left over in your ***living*** **annuity**, it could be left to your heirs.

OPTION 2: *Guaranteed* annuity

- You receive a GUARANTEED predetermined pension income each year for the rest of your ***life***.
- You CANNOT outlive your retirement capital.
- A ***guaranteed*** annuity dies with you, and NO remaining capital can be left to your heirs.

Bearing in mind the information above, I would choose the following retirement income option when I retire from my employer's retirement fund. Please insert an 'X' in the chosen box. You may only tick ONE box.

OPTION 1: A ***living*** **annuity**, where remaining funds (if any) can be left to my heirs when I die, but there is the risk that I will outlive my retirement capital.	
OPTION 2: A ***guaranteed*** **annuity**, where no money can be left to my heirs when I die, but I am guaranteed an income for ***life***.	

SECTION C:

There are no correct or incorrect responses to the statements in this section. Describe your perceptions as accurately as possible by ticking one of the seven response options. For each statement, tick the response that best describes your point of view. If you are unable to respond to a question, please tick number 4.

Please insert an 'X' in the chosen box.

		Strongly Disagree						Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**
1.	I regard myself as someone who is patient.							
2.	Investing in retirement funds has the same tax advantages as other investment funds.							
3.	I am familiar with retirement income options.							
4.	All retirement funds guarantee to pay retirees a pension until their death.							
5.	I have consulted with a financial advisor about retirement income options.							
6.	I prefer investments that offer high returns, even if it is a risky decision.							
7.	It is likely that I will survive to age 75.							
8.	It is likely that I will survive to age 85.							
9.	It is likely that I will survive to age 90 and beyond.							
10.	It makes sense to invest money in the shares of more than one company.							
11.	I make financial planning decisions quickly.							
12.	Pension fund law prohibits retirement funds to invest in shares.							
13.	I educate myself on retirement income options.							
14.	I try to avoid financial risk.							
15.	Insurance companies rip people off.							
16.	I am uncertain about my own biological survival prospects at retirement.							
17.	It is important to have access to cash during retirement for emergencies.							
18.	I intend to keep the death benefits provided by my employer's group life scheme in place after retirement.							
19.	It is important to me to leave an inheritance to my heirs at death.							

SECTION D:

The following questions are **YES/NO** questions. If a question does not apply to your situation, please tick the **N/A** (not applicable) box. Please insert an 'X' in the chosen box.

1.	I buy and sell shares on the share market in my personal capacity.	**YES**	**NO**	**N/A**
2.	I have a life insurance policy (or policies), which I intend to keep in force until death.	**YES**	**NO**	**N/A**
3.	I am a member of a medical aid scheme.	**YES**	**NO**	**N/A**
4.	I have health insurance, for example, gap cover, disability, or critical illness insurance.	**YES**	**NO**	**N/A**

SECTION E:

The questions in this section require information about your demographic characteristics.

Please answer the following questions:

1. ***How old are you? …….years***
2. ***How many years do you have left before you reach retirement? …….years***
3. ***How many people do you support financially (excluding yourself)? …….***
4. ***How many children (including grandchildren) do you have? …….***

5.	**Gender**	Male	Female	Prefer not to say		
6.	**Relationship status**	Single	Married	Co-habiting	Widowed	Separated/ divorced
7.	**Health status**	Excellent	Very good	Good	Fair	Poor
8.	**Highest qualification completed**	Lower than Grade 12/ matric	Grade 12/ matric	Degree/ diploma/ certificate	Post-graduate qualification	
9.	**Which of the following best describes your socio-economic status?**	Low income	Lower middle income	Higher middle income	High income	

KINDLY ENSURE THAT YOU HAVE ANSWERED ALL QUESTIONS.

THANK YOU FOR COMPLETING THE SURVEY AND FOR YOUR KIND COOPERATION.

UNIVERSITEIT STELLENBOSCH UNIVERSITY

SURVEY ON RETIREMENT INCOME OPTIONS

PART 2

Dear retiree,

You are invited to take part in a survey regarding retirees' perceptions and decision-making with respect to their choice of a retirement income option.

Kindly take note:

- The results of this research study being conducted by the **Department of Business Management**, **Stellenbosch University**, will contribute to the researcher, Mrs Jeannie de Villiers-Strijdom, in completing her PhD.
- The necessary **ethical clearance** to conduct the study was obtained from: 1) the Departmental Ethics Screening Committee (DESC), 2) the Research Ethics Committee (REC) (approval number 9101), and 3) the Division for Information Governance (approval number IRPSD1251).
- Your participation is **voluntary**, and you are free to withdraw from the study at any stage.
- The questionnaire will take about **15 minutes to complete**, and will contain questions covering, among others, the factors that may influence your investment decisions.
- The questionnaire will be completed **anonymously**, thereby ensuring **confidentiality**. The researcher will not have access to any participant's identifiers.
- Findings from the research will be **published** and will be available in the public domain.

RIGHTS OF RESEARCH PARTICIPANTS

You have the right to decline answering any specific question, and you can exit the survey at any time without giving a reason. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions about your rights as a research participant, contact Mrs Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development, Stellenbosch University.

If you have any questions or concerns about the research, please feel free to contact the researcher, Mrs Jeannie de Villiers-Strijdom [jeannie@sun.ac.za; 083 318 1780], or her supervisors, Prof Niel Krige [jdkrige@sun.ac.za] and Prof Johann de Villiers [judv@sun.ac.za].

Should you wish to keep a copy of the consent page, take a screenshot of this display and save it to your device.

In order to proceed, please tick **BOTH** boxes.

I confirm that I have read and understand the information on this consent page.	
I agree to take part in this survey.	

INTRODUCTION

Please read all the introductory information carefully before you answer the questions.

IMPORTANT! If you are unsure of the meaning of any highlighted term, a short definition is available in the commentary box.

We are interested in your perceptions, understanding and decision-making with respect to your choice of a retirement income option.

At retirement, you may have purchased a pension income with your retirement capital available from your employer's retirement fund. There are generally two retirement income options to choose from, namely, a ***living* annuity (OPTION 1)** and a ***guaranteed* annuity (OPTION 2)**.

Take note:

- It is possible to follow a mixed strategy where a ***living* annuity** is combined with a ***guaranteed* annuity**.
- For the purpose of this survey, no distinction is made between an in-house or external ***living* annuity** or ***guaranteed* annuity**.

Your two retirement income options are summarised as follows:

OPTION 1: *Living* annuity

- Invest your retirement capital into a product called a ***living* annuity**, where you choose the underlying investments. When choosing this option, you may withdraw pension income every year, subject to a minimum withdrawal rate of **2.5%** and a maximum withdrawal rate of **17.5%** of the total investment amount. *You may therefore choose the amount of income you receive each year, subject to the annual limits.*
- If the pension income you withdraw from your ***living* annuity** consistently **exceeds** the growth on your investment portfolio, the total investment amount could eventually become **DEPLETED** if you have selected this option. *You **CAN** therefore outlive your retirement capital.*
- If you have money left over in your ***living* annuity** when you die, it could be left to your heirs as an inheritance. In other words, with a ***living* annuity**, your remaining capital keeps on ***living***.

OPTION 2: *Guaranteed* annuity

- The alternative option is to use your retirement capital to purchase an **insurance product**, called a ***guaranteed* annuity,** which **GUARANTEES** to pay you a **predetermined** pension income each year for the rest of your ***life***. *You therefore **CANNOT** outlive your retirement capital.*
- You have the choice of choosing either a pension that stays the same each year or a pension that escalates with a certain rate, e.g. the inflation rate, each year.
- If you live sufficiently long after retirement, the total amount of pension income you receive from your ***guaranteed* annuity** may **exceed** your original investment. However, if you die soon after retirement, you will receive in total **less** than what you have paid. In other words, a ***guaranteed* annuity** dies with you, and NO remaining capital can be left to your heirs. Put differently, a ***guaranteed* annuity** ends with your ***life.***

SECTION A:

Bearing in mind the information above, indicate which retirement income option you have chosen. Please insert an 'X' in the chosen box. You may only tick ONE box.

OPTION 1: A ***living*** **annuity**, where remaining funds (if any) can be left to my heirs when I die, but there is the risk that I may outlive my retirement capital.	
OPTION 2: A ***guaranteed*** **annuity**, where no remaining capital can be left to my heirs when I die, but I am guaranteed an income for life.	
OPTION 3: A combination of both a ***living*** **annuity** and a ***guaranteed*** **annuity**.	

SECTION B:

There are no correct or incorrect responses to the statements in this section. Describe your perceptions as accurately as possible by ticking one of the seven response options. For each statement, tick the response option that best describes your point of view. If you are unable to respond to a question, please tick number 4.

Please insert an 'X' in the chosen box.

		Strongly Disagree						**Strongly Agree**
		1	**2**	**3**	**4**	**5**	**6**	**7**
1.	I can withdraw sufficient income from a ***guaranteed*** **annuity** each year.							
2.	I can withdraw above-average income from a ***living*** **annuity** each year.							
3.	I do better by investing my retirement capital in a ***living*** **annuity**, because my capital has the potential to grow.							
4.	I prefer a guaranteed income stream for ***life***.							
5.	I like the flexibility and control of managing a ***living*** **annuity**.							
6.	I prefer to know exactly what my future income stream will be.							
7.	I prefer a ***guaranteed*** **annuity** that runs automatically and that requires no further decision-making from me.							
8.	At death, it is important to me to leave my remaining retirement capital to my heirs.							
9.	I feel confident that insurance companies offering ***guaranteed*** **annuities** will survive over the long term.							
10.	A ***living*** **annuity** is desirable as it allows me access to my retirement capital to pay for unforeseen expenses – for example, medical costs or home repairs.							
11.	The retirement income option I have chosen gives me peace of mind.							
12.	My family would fund any shortfall I might have in retirement, in return for inheriting any money left over in my ***living*** **annuity**.							
13.	It is unfair that insurance companies offering ***guaranteed*** **annuities** keep the excess funds at the annuitant's death.							
14.	It makes sense to exchange my retirement capital for a guaranteed income stream for ***life***.							
15.	I would probably live long enough for a ***guaranteed*** **annuity** to be worthwhile.							
16.	Purchasing a ***guaranteed*** **annuity** from only one insurance company is risky, as that company could become insolvent.							

17.	The retirement income option I have chosen gives me a fair return on my investment.							
18.	Financial advisors selling ***guaranteed*** **annuities** pursue only their own self-interested goals.							
19.	Financial advisors selling ***living*** **annuities** pursue only their own self-interested goals.							
20.	The retirement income option I have chosen gives me a sense of financial security.							
21.	I believe that financial advisors selling ***guaranteed*** **annuities** have their clients' best interests at heart.							
22.	I believe that financial advisors selling ***living*** **annuities** have their clients' best interests at heart.							
23.	It is important to choose the amount of income I receive in retirement each year.							
24.	It is important to choose the financial advisor who manages the underlying investments of my capital in retirement.							
25.	It is important to choose the underlying investments of my capital in retirement myself.							
26.	A ***guaranteed*** **annuity** makes me think about my own death.							
27.	A ***living*** **annuity** makes me think about my own death.							
28.	I fear dying soon.							
29.	I fear outliving my retirement capital.							
30.	I am familiar with a ***guaranteed*** **annuity** as a retirement income option.							
31.	I am familiar with a ***living*** **annuity** as a retirement income option.							
32.	Most people I ask recommend a ***guaranteed*** **annuity.**							
33.	Most people I ask recommend a ***living*** **annuity**.							
34.	My financial advisor recommends a ***guaranteed*** **annuity.**							
35.	My financial advisor recommends a ***living*** **annuity**.							
36.	A ***guaranteed*** **annuity**, as far as I know, is the most popular retirement income option.							
37.	A ***living*** **annuity**, as far as I know, is the most popular retirement income option.							

SECTION C:

There are no correct or incorrect responses to the statements in this section. Describe your perceptions as accurately as possible by ticking one of the seven response options. For each statement, tick the response that best describes your point of view. If you are unable to respond to a question, please tick number 4.

Please insert an 'X' in the chosen box.

		Strongly Disagree						Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**
1.	I regard myself as someone who is patient.							
2.	Investing in retirement funds has the same tax advantages as other investment funds.							
3.	I am familiar with retirement income options.							
4.	All retirement funds guarantee to pay retirees a pension until their death.							
5.	I consult with a financial advisor about retirement income options.							
6.	I prefer investments that offer high returns, even if it is a risky decision.							
7.	It is likely that I will survive to age 85.							
8.	It is likely that I will survive to age 90 and beyond.							
9.	It makes sense to invest money in the shares of more than one company.							
10.	I make financial planning decisions quickly.							
11.	Pension fund law prohibits retirement funds to invest in shares.							
12.	I educate myself on retirement income options.							
13.	I try to avoid financial risk.							
14.	Insurance companies rip people off.							
15.	I am uncertain about my own biological survival prospects.							
16.	It is important to have access to cash during retirement for emergencies.							
17.	It is important to me to leave an inheritance to my heirs at death.							

SECTION D:

The following questions are **YES/NO** questions. If a question does not apply to your situation, please tick the **N/A** (not applicable) box. Please insert an 'X' in the chosen box.

1.	I buy and sell shares on the share market in my personal capacity.	**YES**	**NO**	**N/A**
2.	I have a life insurance policy (or policies), which I intend to keep in force until death.	**YES**	**NO**	**N/A**
3.	I am a member of a medical aid scheme.	**YES**	**NO**	**N/A**
4.	I have kept the death benefits provided by my employer's group life scheme in place after retirement.	**YES**	**NO**	**N/A**
5.	I have health insurance, for example, gap cover, disability, or critical illness insurance.	**YES**	**NO**	**N/A**
6.	I receive income from other assets, apart from my pension income.	**YES**	**NO**	**N/A**
7.	I continue to work in retirement for remuneration.	**YES**	**NO**	**N/A**

SECTION E:

There are no correct or incorrect responses to the statements in this section. Describe your perceptions as accurately as possible by ticking one of the seven response options. For each statement, tick the response that best describes your point of view.

Please insert an 'X' in the chosen box.

		Strongly Disagree						**Strongly Agree**
		1	**2**	**3**	**4**	**5**	**6**	**7**
1.	I am satisfied with my chosen retirement income option.							
2.	I feel regret towards my choice of retirement income option.							
3.	I would choose a different retirement income option, if I could choose again.							
4.	I would change to a different retirement income option in the future, if possible.							
5.	I feel anxious about my financial future.							
6.	I feel comfortable about my financial future.							
7.	I feel hopeful about my financial future.							
8.	I worry about my financial future.							

SECTION F:

The questions in this section require information about your demographic characteristics.

Please answer the following questions:

1. ***How old are you? …….years***
2. ***How many years have you been retired? …….years***
3. ***How many people do you support financially (excluding yourself)? …….***
4. ***How many children (including grandchildren) do you have? …….***

5.	**Gender**	Male	Female	Prefer not to say		
6.	**Relationship status**	Single	Married	Co-habiting	Widowed	Separated/ divorced
7.	**Health status**	Excellent	Very good	Good	Fair	Poor
8.	**Highest qualification completed**	Lower than Grade 12/ matric	Grade 12/ matric	Degree/ diploma/ certificate	Post-graduate qualification	
9.	**Which of the following best describes your socio-economic status?**	Low income	Lower middle income	Higher middle income	High income	

KINDLY ENSURE THAT YOU HAVE ANSWERED ALL QUESTIONS.

THANK YOU FOR COMPLETING THE SURVEY AND FOR YOUR KIND COOPERATION

APPENDIX D: ITEM CODES

Table D.1 represents the item code names (or export tags) assigned to questions as is shown in the first column of Table D.1. The question numbers in the table (e.g. Q1.1) correspond to the question number used in Qualtrics. The second column refers to the section and question number for each item (or question) in the MS Word version of the questionnaire (See Appendix C).

An item code was also assigned to each response option as shown in the second column of Table D.2 (See Appendix D). The question numbers in the table (e.g. Q1) correspond to the question numbers used in Qualtrics. As Q5.1-Q5.4 refer to open-ended questions (e.g. “How old are you?”), no codes were assigned to response options. The third column refers to the section and question number for each response option in the MS Word version of the questionnaire (See Appendix C).

(See Section 5.7.2 for a discussion of the pre-testing for Part 1 of the study).

Table D.1: Pre-testing of the questionnaire for Part 1: Item codes

Item code name/Export tag	MS Word
Q1.1	
AAP1	A1
INV1	A2
INV2	A3
CERT1	A4
FLEX1	A5
CERT2	A6
CERT3	A7
BQM1	A8
Q1.2	
DEF1	A9
ACC1	A10
POM1	A11
POM2	A12
BQM2	A13
AAP2	A14
AAP3	A15
MORT1	A16
Q1.3	
DEF2	A17
ROI1	A18
ROI2	A19
TRUST1	A20
TRUST2	A21
FINS1	A22
FINS2	A23
TRUST3	A24
Q1.4	
TRUST4	A25
FLEX2	A26
FLEX3	A27
FLEX4	A28
MSAL1	A29
MSAL2	A30
MORT2	A31
Q2	
AIP	B

Source: Author’s conception.

Table D.1: Pre-testing of the questionnaire for Part 1: Item codes (continued)

Item code name/Export tag	MS Word
Q3.1	
PAT1	C1
FINL1	C2
CONS1	C3
FINL2	C4
CONS2	C5
AVER1	C6
MORT3	C7
MORT4	C8
MORT5	C9
FINL3	C10
PAT2	C11
FINL4	C12
CONS3	C13
AVER2	C14
AAP4	C15
MORT6	C16
ACC2	C17
INS	C18
BQM3	C19
Q4	
SHARES	D1
POL	D2
MEDICAL	D3
HPOL	D4
Q5	
AGE	E1
YRS	E2
SUPPORT	E3
CHILDREN	E4
GENDER	E5
RELATION	E6
HEALTH	E7
EDU	E8
ECO	E9

Source: Author’s conception.

Table D.2: Pre-testing of the questionnaire in Part 1: Codes for response options

Response option	Code	MS Word
Q1 & Q3		
Strongly disagree	1	A, C
Disagree	2	
Somewhat disagree	3	
Neither agree nor disagree	4	
Somewhat agree	5	
Agree	6	
Strongly agree	7	
Q4		
YES	1	D
NO	2	
N/A	3	
Q2		
OPTION 1: LIVING	1	B
OPTION 2: GUARANTEED	2	
Consent		
IC (I confirm)	1	Consent
IA (I agree)	1	
Q5.1 - Q5.4		
Open-ended		E1 – E4
Q5.5		
Male	1	E5
Female	2	
Prefer not to say	3	
Q5.6		
Single	1	E6
Married	2	
Co-habiting	3	
Widowed	4	
Separated/divorced	5	

Table D.2: Pre-testing of the questionnaire in Part 1: Codes for response options (continued)

Response option	Code	MS Word
Q5.7		
Excellent	1	E7
Very good	2	
Good	3	
Fair	4	
Poor	5	
Q5.8		
Lower than Grade 12	1	E8
Grade 12	2	
Degree/diploma/certificate	3	
Postgraduate	4	
Q5.9		
Low income	1	E9
Lower middle income	2	
Higher middle income	3	
High income	4	

Source: Author's conception.

APPENDIX E:

ITEMS

Table E.1: Items of independent variables for the benefit perceptions of living annuities: Part 1

Independent variables	Item 1	Item 2	Item 3	Item 4	Item 5
RC MANAGE	INV2	FLEX1			
BEQUEST MOTIVE	BQM1	BQM2	BQM3		
ACCESS_GEN	ACC2				
ACCESS_RC	ACC1				
MORTALITY RISK	MORT2	MORT3	MORT4	MORT5	MORT6
TRUST IN ADVISOR	TRUST2	TRUST4			
MORTALITY SALIENCE	MSAL2				
PATIENCE_GEN	PAT1				
FIN_SPEED	PAT2				
LITERACY	FINL1	FINL2	FINL3	FINL4	
AWARENESS	CONS1	CONS3			
RISK AVERSION	AVER1	AVER2			
INSURANCE	INS				

Source: Author's conception.

Table E.2: Items of independent variables for the benefit perceptions of guaranteed annuities: Part 1

Independent variables	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
FAIRNESS	AAP2					
CERTAINTY	CERT1	CERT2	CERT3			
DEFAULT RISK_SURVIVE	DEF1					
DEFAULT RISK_DIVERSE	DEF2					
MORTALITY RISK	MORT1	MORT2	MORT3	MORT4	MORT5	MORT6
TRUST IN ADVISOR	TRUST1	TRUST3				
MORTALITY SALIENCE	MSAL1					
PATIENCE_GEN	PAT1					
FIN_SPEED	PAT2					
LITERACY	FINL1	FINL2	FINL3	FINL4		
AWARENESS	CONS1	CONS3				
RISK AVERSION	AVER1	AVER2				
INSURANCE	INS					

Source: Author’s conception.

Table E.3: Items of independent variables for the intention to annuitise: Part 1

Independent variables	Item 1	Item 2	Item 3	Item 4	Item 5
RC MANAGE	INV2	FLEX1			
BEQUEST MOTIVE	BQM1	BQM2	BQM3		
ACCESS_RC	ACC1				
ACCESS_GEN	ACC2				
MORTALITY RISK	MORT2	MORT3	MORT4	MORT5	MORT6
TRUST IN ADVISOR_LIV	TRUST2	TRUST4			
TRUST IN ADVISOR_GA	TRUST1	TRUST3			
MORTALITY SALIENCE_LIV	MSAL2				
MORTALITY SALIENCE_GA	MSAL1				
PATIENCE_GEN	PAT1				
FIN_SPEED	PAT2				
LITERACY	FINL1	FINL2	FINL3	FINL4	
AWARENESS_NEW	CONS1	CONS3			
RISK AVERSION	AVER1	AVER2			
INSURANCE	INS				
FAIRNESS	AAP2				
CERTAINTY	CERT1	CERT2	CERT3		
DEFAULT RISK_SURVIVE	DEF1				
DEFAULT RISK_DIVERSE	DEF2				
BENEFIT_LIV	POM2	FINS2	ROI2		
BENEFIT_GA	POM1	FINS1	ROI1		

Source: Author’s conception.

Table E.4: Items of independent variables for satisfaction levels: Part 2

Independent variables	Item 1	Item 2	Item 3	Item 4	Item 5
RC MANAGE	FLEX1	INV2			
BEQUEST MOTIVE	BQM1	BQM2	BQM3		
ACCESS_RC	ACC1				
ACCESS_GEN	ACC2				
MORTALITY RISK	MORT4	MORT5			
TRUST IN ADVISOR_LIV	TRUST2	TRUST4			
FEAR OUTLIVE RC	MORT2				
MORTALITY SALIENCE	MSAL2				
PATIENCE_GEN	PAT1				
FIN_SPEED	PAT2				
LITERACY	FINL1	FINL2	FINL3	FINL4	
AWARENESS_AIP	CONS1	CONS3			
AWARENESS_LIV	CONSLIV				
RISK AVERSION	AVER1	AVER2			
INFLUENCE	INFL2	INFL4	INFL6		
BENEFIT (POST)	POM	FINS	ROI		

Source: Author’s conception.

APPENDIX F:

RESULTS

Table F.1: Descriptive statistics for all variables – Benefit perceptions of living annuities: Part 1(A)

Variables[282]	Mean	Standard deviation	Median
BENEFIT_LIV	4.9	1.1	5.0
BEQUEST MOTIVE	5.2	1.2	5.3
TRUST IN ADVISOR_LIV	3.9	1.3	4.0
RC MANGE	5.5	1.2	6.0
PAT_GEN	5.4	1.1	6.0
FIN_SPEED	4.3	1.6	5.0
LITERACY	5.0	1.0	5.0
AWARENESS_NEW	4.7	1.1	5.0
RISK AVERSION	3.9	1.2	4.0
ACCESS_GEN	6.1	.9	6.0
ACCESS_RC	5.2	1.3	6.0
MORTALITY SALIENCE_LIV	4.2	1.6	4.0
MORTALITY RISK	4.4	.9	4.4

Source: Author's conception.

[282] All variables were measured linked to a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree).

Table F.2: Descriptive statistics for all variables – Benefit perceptions of guaranteed annuities: Part 1(B)

Variables[283]	Mean	Standard deviation	Median
BENEFIT_GA	5.2	.9	5.3
AWARENESS_NEW	4.2	1.4	4.0
CERTAINTY	5.9	.8	6.0
MORTALITY RISK	4.7	.9	4.8
RISK AVERSION	3.4	1.1	3.5
DEFAULT RISK_SURVIVE	4.3	1.3	4.0
DEFAULT RISK_DIVERSE	2.5	1.1	2.0
INSURANCE	5.4	1.4	6.0
MORTALITY SALIENCE_LIV	4.2	1.8	4.0
PAT_GEN	5.2	1.5	6.0
FIN_SPEED	4.6	1.2	5.0
LITERACY	5.0	.8	4.9
TRUST IN ADVISOR	3.7	1.1	4.0
FAIRNESS	3.2	1.8	3.0

Source: Author's conception.

[283] All variables were measured linked to a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree).

Table F.3: Descriptive statistics for all variables – Intention to annuitise: Part 1(C)

Variables[284]	Mean	Standard deviation	Median
CERTAINTY	5.0	1.4	5.0
BEQUEST MOTIVE	4.7	1.4	5.0
TRUTS IN ADVISOR_GA	3.5	1.2	4.0
TRUST IN ADVISOR_LIV	3.8	1.2	4.0
RC MANGE	4.9	1.4	5.0
PAT_GEN	5.3	1.3	6.0
FIN_SPEED	4.4	1.6	5.0
LITERACY	5.0	.9	5.0
AWARENESS_NEW	4.5	1.2	4.5
RISK AVERSION	3.7	1.2	3.5
INSURANCE	5.4	1.4	6.0
FAIRNESS	3.1	1.9	3.0
DEFAULT RISK_SURVIVE	4.3	1.4	4.0
DEFAULT RISK_DIVERSE	2.5	1.1	2.0
ACCESS_GEN	6.0	.9	6.0
ACCESS_RC	4.9	1.5	5.0
MORTALITY SALIENCE_LIV	4.2	1.7	4.0
MORTALITY SALIENCE_GA	4.3	1.7	4.0
BENEFIT_LIV	4.5	1.2	4.7
BENEFIT_GA	4.6	1.3	4.7
MORTALITY RISK	4.5	1.0	4.6

Source: Author's conception.

[284] All variables were measured linked to a seven-point Likert scale.

Table F.4: Comparison of responses for demographic variables: Part 1

Variables	Living	Life	Codes
SHARES	Yes: 28.4% No: 57.4% N/A: 14.2%	Yes: 20.2% No: 68.4% N/A: 11.4%	Yes coded as 1. No coded as 0. N/A coded as 0.
LIFE INSURANCE POLICY	Yes: 74.6% No: 22.8% N/A: 2.5%	Yes: 71.1% No: 25.4% N/A: 3.5%	Yes coded as 1. No coded as 0. N/A coded as 0.
MEDICAL SCHEME MEMBERSHIP	Yes: 95.9% No: 2.5% N/A: 1.5%	Yes: 98.2% No: 1.8% N/A: 0%	Yes coded as 1. No coded as 0. N/A coded as 0.
HEALTH INSURANCE	Yes: 76.6% No: 20.8% N/A: 2.5%	Yes: 86.0% No: 13.2% N/A: .9%	Yes coded as 1. No coded as 0. N/A coded as 0.
GENDER	Male: 65.0% Female: 35.0% Prefer not to say: 0%	Male: 41.2% Female: 58.8% Prefer not to say: 0%	Male coded as 1. Female coded as 0.
RELATIONSHIP STATUS	Single: 6.1% Married: 81.7% Co-habiting: 3.0% Widowed: 2.5% Separated/divorced: 6.6%	Single: 11.4% Married: 72.8% Co-habiting: 7.9% Widowed: 1.8% Separated/divorced: 6.1%	Single coded as 0. Married coded as 1. Co-habiting coded as 0. Widowed coded as 0. Separated/divorced coded as 0.
HEALTH STATUS	Excellent: 26.4% Very good: 41.6% Good: 25.4% Fair: 6.6% Poor: 0%	Excellent: 32.5% Very good: 35.1% Good: 25.4% Fair: 7.0% Poor: 0%	Excellent coded as 1. Very good coded as 2. Good coded as 3 Fair coded as 4.
QUALIFICATION	Lower than Grade 12/ matric: 3% Grade 12/matric: 6.6% Degree/diploma/ certificate: 38.1% Postgraduate qualification: 52.3%	Lower than Grade 12/ matric: .9% Grade 12/matric: 3.5% Degree/diploma/ certificate: 35.1% Postgraduate qualification: 60.5%	Lower than Grade 12/matric coded as 0. Grade 12/matric coded as 0. Degree/diploma/ certificate coded as 1. Postgraduate qualification coded as 1.
INCOME STATUS	Low income: 1.0% Lower middle income: 33.5% Higher middle income: 49.2% High income: 16.2%	Low income: .9% Lower middle income: 31.6% Higher middle income: 51.8% High income: 15.8%	Low income coded as 0. Lower middle income coded as 0. Higher middle income coded as 1. High income coded as 1.
AGE	Mean: 50.97	Mean: 48.89	

Source: Author's conception.

Table F.5: Descriptive statistics for all variables – Satisfaction levels of living annuitants: Part 2

Variables[285]	Mean	Standard deviation	Median
SATISFACTION	5.0	1.2	5.1
BENEFIT_POST	5.0	1.4	5.3
FEAR OUTLIVE	4.3	1.9	5.0
LITERACY	5.3	.9	5.3
AWARE_AIP	5.2	1.1	5.5
MANAGE_RC	5.7	1.2	6.0
AWARE_LIV	5.0	1.0	6.0
MORTALITY RISK	4.3	1.5	4.0
TRUST IN ADVISOR	4.1	1.4	4.0
ACCESS_GEN	6.1	.9	6.0
ACCESS_RC	4.0	1.9	4.0
BEQUEST MOTIVE	4.6	1.2	4.7
MORTALITY SALIENCE	3.4	1.6	4.0
PATIENCE_GEN	4.9	1.5	5.0
FIN_SPEED	4.1	1.6	4.0
RISK AVERSION	3.6	1.4	3.5
INFLUENCE	4.6	.9	4.7

Source: Author's conception.

[285] All variables were measured linked to a seven-point Likert scale (1 meant strongly disagree and 7 meant strongly agree).

Table F.6: Comparison of responses for demographic variables: Part 2

Variables[286]	Living	Life	Combination	Codes
SHARES	Yes: 33.6% No: 60.3% N/A: 6.1%	Yes: 33.3% No: 50% N/A: 16.7%	Yes: 35.5% No: 48.4% N/A: 16.1%	Yes coded as 1. No coded as 0. N/A coded as 0.
LIFE INSURANCE POLICY	Yes: 42.8% No: 52.4% N/A: 4.8%	Yes: 50% No: 41.7% N/A: 8.3%	Yes: 53.2% No: 38.7% N/A: 8.1%	Yes coded as 1. No coded as 0. N/A coded as 0.
MEDICAL SCHEME MEMBERSHIP	Yes: 96.1% No: 3.5% N/A: .4%	Yes: 75% No: 16.7% N/A: 8.3%	Yes: 91.9% No: 8.1% N/A: 0%	Yes coded as 1. No coded as 0. N/A coded as 0.
GROUP LIFE INSURANCE	Yes: 34.5% No: 42.8% N/A: 22.7%	Yes: 41.7% No: 25.0% N/A: 33.3%	Yes: 22.6% No: 40.3% N/A: 37.1%	Yes coded as 1. No coded as 0. N/A coded as 0.
HEALTH INSURANCE	Yes: 57.6% No: 39.7% N/A: 2.6%	Yes: 58.3% No: 33.3% N/A: 8.3%	Yes: 41.9% No: 50% N/A: 8.1%	Yes coded as 1. No coded as 0. N/A coded as 0.
INCOME FROM OTHER ASSETS	Yes: 79.5% No: 18.3% N/A: 2.2%	Yes: 50% No: 41.7% N/A: 8.3%	Yes: 77.4% No: 17.7% N/A: 4.8%	Yes coded as 1. No coded as 0. N/A coded as 0.
CONTINUED WORK	Yes: 42.4% No: 53.7% N/A: 3.9%	Yes: 41.7% No: 50% N/A: 8.3%	Yes: 40.3% No: 56.5% N/A: 3.2%	Yes coded as 1. No coded as 0. N/A coded as 0.
GENDER	Male: 84.7% Female: 15.3% Unknown: 0%	Male: 58.3% Female: 41.7% Unknown: 0%	Male: 85.5% Female: 14.5% Unknown: 0%	Male coded as 1. Female coded as 0.
RELATIONSHIP STATUS	Single: 3.5% Married: 80.8% Co-habiting: 2.6% Widowed: 7.4% Separated/ divorced: 5.7%	Single: 0% Married: 58.3% Co-habiting: 8.3% Widowed: 25.0% Separated/ divorced: 8.3%	Single: 0% Married: 79% Co-habiting: 4.8% Widowed: 12.9% Separated/ divorced: 3.2%	Single coded as 0. Married coded as 1. Co-habiting coded as 0. Widowed coded as 0. Separated/ divorced coded as 0.
HEALTH STATUS	Excellent: 17.0% Very good: 41.0% Good: 28.4% Fair: 13.5% Poor: 0%	Excellent: 16.7% Very good: 41.7% Good: 33.3% Fair: 8.3% Poor: 0%	Excellent: 14.5% Very good: 41.9% Good: 30.6% Fair: 12.9% Poor: 0%	Excellent coded as 1. Very good coded as 2. Good coded as 3 Fair coded as 4.

[286] Some of the subcategories per independent variable do not exactly add up to 100, due to the rounding of percentages to one decimal point in SPSS.

Table F.6: Comparison of variables among groups: Part 2 (continued)

Variables[287]	Living	Life	Combination	Codes
QUALIFICATION	Lower than Grade 12/ matric: 1.3% Grade 12/matric: 10.9% Degree/diploma/ certificate: 37.1% Postgraduate qualification: 50.7%	Lower than Grade 12/ matric: 0% Grade 12/matric: 25% Degree/diploma/ certificate: 41.7% Postgraduate qualification: 33.3%	Lower than Grade 12/ matric: 0% Grade 12/matric: 12.9% Degree/diploma/ certificate: 33.9% Postgraduate qualification: 53.2%	Lower than Grade 12/matric coded as 0. Grade 12/matric coded as 0. Degree/diploma/ certificate coded as 1. Postgraduate qualification coded as 1.
INCOME STATUS	Low income: 4.4% Lower middle income: 28.4% Higher middle income: 59% High income: 8.3%	Low income: 25.0% Lower middle income: 25.0% Higher middle income: 33.3% High income: 16.7%	Low income: 3.2% Lower middle income: 27.4% Higher middle income: 62.9% High income: 6.5%	Excellent coded as 1. Very good coded as 2. Good coded as 3 Fair coded as 4.

Source: Author's conception.

Table F.7: Marital status – Descriptive statistics: Part 2

Satisfaction	Frequency	Mean	Std. Deviation	Std. Error Mean
Group 1 (Unmarried)	44	4.8267	1.24715	.18802
Group 2 (Married)	185	4.9811	1.19789	.08807

Source: Author's conception.

Table F.8: Marital status – Independent samples t-test: Part 2

	Levene's Test for Equality of Variances				
Satisfaction	**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**
Equal variances assumed	.204	.652	-.762	227	.447
Equal variances not assumed			-.744	63.229	.460

Source: Author's conception.

[287] Some of the subcategories per independent variable do not exactly add up to 100, due to the rounding of percentages to one decimal point in SPSS.

Table F.9: Age – Correlations: Part 2

Satisfaction		Age	Satisfaction
SATISFACTION	**Pearson Correlation**	1	-.051
	Sig. (2-tailed)		.444
	N	229	229
AGE	**Pearson Correlation**	-.051	1
	Sig. (2-tailed)	.444	
	N	229	229

Source: Author's conception.

Table F.10: Age – Descriptive Statistics: Part 2

	Mean	Std. Deviation	N
AGE	71.11	6.377	229
SATISFACTION	4.9514	1.20626	229

Source: Author's conception.

Table F.11: Health status – ANOVA: Part 2

Satisfaction	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	29.765	3	9.922	7.392	0.000
Within Groups	301.991	225	1.342		
Total	331.756	228			

Source: Author's conception.

Table F.12: Health status – Descriptive Statistics: Part 2

Satisfaction	N	Mean	Std. Deviation
Excellent	39	5.4359	1.08438
Very good	94	5.1649	1.19281
Good	65	4.5962	1.16650
Fair	31	4.4395	1.12401

* No respondents chose "poor health".

Source: Author's conception.

Table F.13: Health status – Scheffe: Part 2

(I) HEALTH	(J) HEALTH	Mean difference (I-J)	Std. Error	Sig.
Excellent	Very good	0.27100	0.22067	0.681
	Good	0.83974**	0.23466	0.006
	Fair	0.99638**	0.27877	0.006
Very good	Excellent	-0.27100	0.22067	0.681
	Good	0.56874*	0.18689	0.028
	Fair	0.72538*	0.23995	0.030
Good	Excellent	-0.83974**	0.23466	0.006
	Very good	0.56874*	0.18689	0.028
	Fair	0.15664	0.25287	0.943
Fair	Excellent	-0.99638**	0.27877	0.006
	Very good	-0.72538*	0.23995	0.030
	Good	-0.15664	0.25287	0.943

* The mean difference is significant at the 0.05 level.

Source: Author's conception.

Table F.14: Income status – Descriptive Statistics: Part 2

Satisfaction	N	Mean	Std. Deviation	Std. Error Mean
Group 1 (Low income)	75	4.2933	1.23906	.14307
Group 2 (High income)	154	5.2719	1.05362	.08490

Source: Author's conception.

Table F.15: Income status – Independent samples test: Part 2

	Levene's Test for Equality of Variances				
Satisfaction	**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**
Equal variances assumed	2.634	.106	6.219	227	0.000
Equal variances not assumed			5.882	127.639	0.000

Source: Author's conception.

Table F.16: Medical Scheme Membership - Descriptive Statistics: Part 2

Satisfaction	N	Mean	Std. Deviation	Std. Error Mean
Group 1 (Medical scheme membership)	220	4.9824	1.18081	.07961
Group 2 (No medical scheme membership)	9	4.1944	1.62152	.54051

Source: Author's conception.

Table F.17: Medical Scheme Membership – Independent samples t-test: Part 2

	Levene's Test for Equality of Variances				
Satisfaction	**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**
Equal variances assumed	2.384	.124	-1.932	227	.055
Equal variances not assumed			-1.442	8.351	.186

Source: Author's conception.

Table F.18: Health insurance – Descriptive Statistics: Part 2

Satisfaction	N	Mean	Std. Deviation	Std. Error Mean
Group 1 (Health insurance)	132	5.1155	1.07625	.09368
Group 2 (No health insurance)	97	4.7281	1.33707	.13576

Source: Author's conception.

Table F.19: Health insurance – Independent samples t-test: Part 2

	Levene's Test for Equality of Variances				
Satisfaction	**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**
Equal variances assumed	4.269	.040	-2.427	227	.016
Equal variances not assumed			-2.349	179.377	.020

Source: Author's conception.

APPENDIX G:

ANNUITY DECISION-MAKING TOOL: PRE-RETIREMENT PERIOD

Appendix G and Appendix H include an annuity decision-making tool, each consisting of a questionnaire and user's manual, to be used by counsellors and financial advisors when guiding their clients in making an informed and well-considered decision with respect to choosing an optimal AIP.

The annuity decision-making tool is still in development, and will be converted into a sophisticated and user-friendly software application in the near future.

The first questionnaire and user's manual (Appendix G) are aimed at individuals in their pre-retirement period of having to choose between self-annuitisation and a guaranteed post-retirement income stream.

The second questionnaire and user's manual (Appendix H) are aimed at living annuitants in their post-retirement period, who have the option to convert their living annuity capital into a guaranteed annuity income stream sometime in the future, either in part, or in full.

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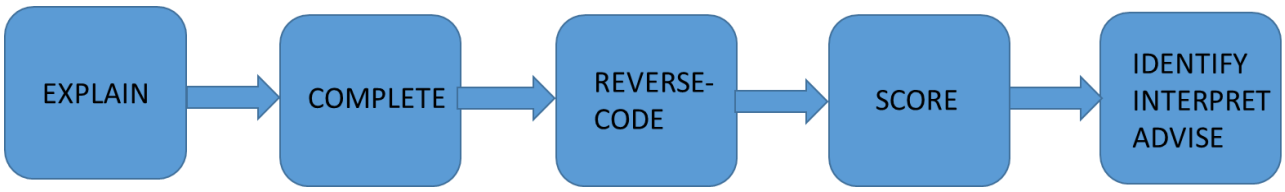
ANNUITY INCOME PRODUCT

DECISION-MAKING TOOL

(Pre-retirement)

AN INSTRUCTION MANUAL FOR THE FINANCIAL ADVISOR
OR
BENEFIT COUNSELLOR

5-STEP ACTION PLAN



- *STEP 1:* ***Explain. Explain*** *the annuity income products to client. See "Information Sheet".*
- *STEP 2:* ***Complete.*** *Client* ***completes*** *the questionnaire. See "Annuity income products decision-making tool".*
- *STEP 3:* ***Reverse-code.*** *Reverse-code data generated from certain specified questions. See "Reverse-code Sheet".*
- *STEP 4:* ***Score****. Score individually per question/item.*
- *STEP 5:* ***Identify, interpret and advise****. Identify factors and give interpretation based on score results. Advise client by focussing on discussion points. See "Interpretation Sheet".*

INFORMATION SHEET

When you retire from your retirement fund(s), you are required to convert your retirement capital into an income stream. The two main retirement income options available to you are: (1) a ***living*** **annuity** and (2) a ***guaranteed (or life)*** **annuity**.

Your two main retirement income options are summarised as follows:

1. Living annuity

- Invest your retirement capital in a product called a ***living*** **annuity**, where you choose the underlying investments. When choosing this option, you may withdraw pension income every year, subject to a minimum withdrawal rate of **2.5%** and a maximum withdrawal rate of **17.5%** of the total investment amount. *You may therefore choose the amount of income you receive each year, subject to the annual limits.*
- If the pension income you withdraw from your ***living*** **annuity** consistently **exceeds** the growth on your investment portfolio, the total investment amount could eventually become **DEPLETED** if you select this option. *You **CAN** therefore outlive your retirement capital.*
- If you have money left in your ***living*** **annuity** when you die, it could be left to your heirs as an inheritance. In other words, with a ***living*** **annuity**, your remaining capital keeps on ***living***.

2. G*uaranteed (or life)* annuity

- The alternative option is to use your retirement capital to purchase an **insurance product**, called a ***guaranteed (or life)*** **annuity,** which **GUARANTEES** to pay you a **predetermined** pension income each year for the rest of your ***life***. *You therefore **CANNOT** outlive your retirement capital.*
- You have the choice of choosing either a pension that stays the same each year or a pension that escalates with a certain rate, e.g. the inflation rate, each year.
- If you live sufficiently long after retirement, the total amount of pension income you receive from your ***guaranteed (or life)*** **annuity** may **exceed** your original investment. However, if you die soon after retirement, you will receive in total **less** than what you have paid. In other words, a ***guaranteed (or life)*** **annuity** dies with you, and NO remaining capital can be left to your heirs. Put differently, a ***guaranteed (or life)*** **annuity** ends with your ***life.***

REVERSE-CODE SHEET

The data generated from the following questions should be reverse-coded before analysis:

- Q9
- Q17
- Q21
- Q10

7->1
6->2
5->3
4->6
3->5
2->6
1->7

INTERPRETATION SHEET

If your client scores 5 to 7 on average for each factor, he/she values the attributes of a living annuity.

The following factors contribute to the client's benefit perception:

Table G.1: Benefit perceptions of living annuity

Q	Factor	Interpretation	Discussion points
2, 4	RC Manage	Managing retirement capital to earn superior capital growth contributes positively to the benefit perceptions of a living annuity.	• Be mindful of the following cognitive biases: (i) investment versus consumption frame, also as it relates to risk orientation; (ii) *status quo* bias; (iii) automatic thinking versus deliberate thinking. • Difficulty of managing retirement capital in old age/sickly/financially illiterate surviving spouse. • Negative effect of managing living annuity capital on satisfaction in retirement. • Flexibility comes at a cost – be aware (advisor fees). • Most clients invest in same unit trusts, rarely alter the contract specifications at anniversary date. • May withdraw too much – risk of outliving retirement capital (and not maintaining living standards in retirement or becoming dependent on state and family members).
7	Access_RC	Accessibility to retirement capital contributes positively to the benefit perceptions of a living annuity.	• For what expenses? • Consider alternatives.
9,14	Trust in advisor	Trust in advisors selling living annuities contributes positively to the benefit perceptions of a living annuity.	• Consider all options and strategies. • No one size fits all. • Advisor may also be influenced by cognitive biases. • High involvement product. • Manage expectations.
16,18	AIP awareness	Awareness of annuity income products contributes positively to the benefit perceptions of a living annuity.	• Empower client with knowledge, pros and cons of all strategies. • Holistic and balanced approach.
6,8,19	Bequest motive	Bequest motive contributes positively to the benefit perceptions of a living annuity.	• What is the force underlying the motive – altruism, ego, risk-sharing within families/between spouses? • Be mindful of the following cognitive biases: loss aversion/endowment effect; thinking in mental models. • Alternatives bequests, e.g. life insurance (accidental death cover if client is uninsurable); donations while retiree is alive, other assets e.g. property. • Negative bequest if retirement capital is outlived. (Create awareness of risk-order bias and risk orientation).

If your client scores 5 to 7 of average for each factor, he/she values the attributes of a guaranteed annuity. The following factors contribute to the client's benefit perception:

Table G.2: Benefit perceptions of guaranteed annuity

Q	Factor	Interpretation	Discussion points
16,18	AIP awareness	Awareness of annuity income products contributes positively to the benefit perceptions of a guaranteed annuity.	• Empower client with knowledge, pros and cons of all strategies. • Holistic and balanced approach.
1,3,5	Certainty	Certainty contributes positively to the benefit perceptions of a guaranteed annuity.	• Minimum involvement. • Plan ahead. • Don't have to manage retirement capital (satisfaction). • No fear of outliving retirement capital (satisfaction). • Make other provisions for unforeseen expenses…or holidays etc.
11,12,13, 17,20	Mortality risk (low)	Low mortality risk contributes positively to the benefit perceptions of a guaranteed annuity.	• Expect many payments if mortality risk is low. • Chronological versus biological age.
21,22	Risk aversion (high)	High risk aversion contributes positively to the benefit perceptions of a guaranteed annuity.	• Highly risk averse individuals may appreciate the protection against longevity and investment risk that guaranteed annuities afford.

If your client scores 5 to 7 on average for each factor, he/she will have a lower intention to annuitise. The following factors contribute to his/her bias:

Table G.3: Intention to annuitise (decreasing factors)

Q	Factor	Interpretation	Discussion points
6,8,19	Bequest motive	Bequest significantly affects intention to choose a living annuity.	• What is the force underlying the motive – altruism, ego, risk-sharing within families/between spouses? • Be mindful of the following cognitive biases: loss aversion/endowment effect; thinking in mental models. • Alternatives bequests, e.g. life insurance (accidental death cover if client is uninsurable); donations while retiree is alive, other assets e.g. property • Negative bequest if retirement capital is outlived. (Create awareness of risk-order bias and risk orientation).
9,14	Trust in advisor (LIV)	Trust in advisor selling living annuities significantly affects intention to choose a living annuity	• Consider all options and strategies. • No one size fits all. • Advisor may also be influenced by cognitive biases. • High involvement product. • Manage expectations.
2,4	RC Manage	Managing retirement capital to earn superior capital growth contributes positively to the benefit perceptions of a living annuity.	• Be mindful of the following cognitive biases: (i) investment versus consumption frame, also as it relates to risk orientation; (ii) *status quo* bias; (iii) automatic thinking versus deliberate thinking. • Difficulty of managing retirement capital in old age/sickly/financially illiterate surviving spouse. • Negative effect of managing living annuity capital on satisfaction in retirement. • Flexibility comes at a cost – be aware (advisor fees). • Most clients invest in same unit trusts, rarely alter the contract specifications at anniversary date. • May withdraw too much – risk of outliving retirement capital (and not maintaining living standards in retirement or becoming dependent on state and family members).

If your client scores 5 to 7 on average for each factor, he/she will be more likely to annuitise. The following factors contribute to his/her bias:

Table G.4: Intention to annuitise (increasing factors)

Q	Factor	Interpretation	Discussion points
1,3,5	Certainty	Certainty contributes positively to the benefit perceptions of a guaranteed annuity.	• Minimum involvement. • Plan ahead. • Don't have to manage retirement capital (satisfaction). • No fear of outliving retirement capital (satisfaction). • Make provision for unforeseen expenses…or holidays etc.
10,15	Trust in advisor (GA)	Trust in advisor selling guaranteed annuity contributes positively to the benefit perceptions of a guaranteed annuity.	• Minimum involvement. • Low fees. • Blended and switching options not possible – irreversibility.

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ANNUITY INCOME PRODUCTS

DECISION-MAKING TOOL

(Pre-retirement)

CLIENT NAME: _____

DATE: _____

SECTION A:

This questionnaire is a tool to assist you with optimal decision-making as it relates to your choice of an annuity income product(s).

The two main types of annuity income products available to you are (1) a ***living*** **annuity** and (2) a ***guaranteed (or life)*** **annuity.**

A quick reminder of what the two options entail:

1. *Living* annuity

- You choose the underlying investments and the amount of pension income you receive each year, subject to a minimum and maximum withdrawal rate.
- You CAN outlive your retirement capital.
- If you have money left in your ***living*** **annuity**, it could be left to your heirs.

2. *Guaranteed (or life)* annuity

- You receive a GUARANTEED predetermined pension income each year for the rest of your ***life***.
- You CANNOT outlive your retirement capital.
- A ***guaranteed (or life)*** annuity dies with you, and NO remaining capital can be left to your heirs.

SECTION B:

There are no correct or incorrect responses to the statements in this section. Describe your perceptions as accurately as possible by ticking one of the seven response options. For each statement, tick the response option that best describes your point of view. If you are unable to respond to a question, please tick number 4.

Please insert an 'X' in the chosen box.

		Strongly Disagree						Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**
1.	I prefer a guaranteed income stream for life.							
2.	I would probably do better by investing my retirement capital in a ***living*** **annuity**, because my capital would have the potential to grow.							
3.	I prefer to know exactly what my future income stream will be.							
4.	I like the flexibility and control of managing a ***living*** **annuity**.							
5.	I prefer a guaranteed annuity that runs automatically and that requires no further decision-making from me.							
6.	At death, it is important to me to leave my remaining retirement capital to my heirs.							
7.	A ***living*** **annuity** is desirable as it allows me access to my retirement capital to pay for unforeseen expenses – for example, medical costs or home repairs.							
8.	My family would fund any shortfall I might have in retirement, in return for inheriting any money left in my ***living*** **annuity**.							
9.	Financial advisors selling ***living*** **annuities** pursue only their own self-interested goals.							
10.	Financial advisors selling ***guaranteed*** **annuities** pursue only their own self-interested goals.							
11.	It is likely that I will survive to age 75.							
12.	It is likely that I will survive to age 85.							
13.	It is likely that I will survive to age 90 and beyond.							
14.	I believe that financial advisors selling ***living*** **annuities** have their clients' best interests at heart.							
15.	I believe that financial advisors selling ***guaranteed*** **annuities** have their clients' best interests at heart.							
16.	I am familiar with retirement income options.							
17.	I am uncertain about my biological survival prospects at retirement.							
18.	I educate myself on retirement income options.							

19.	It is important to me to leave an inheritance to my heirs at death.							
20.	I fear outliving my retirement capital.							
21.	I prefer investments that offer high returns, even if it is a risky decision.							
22.	I try to avoid financial risk.							

SECTION C:

The following questions are **YES/NO** questions. If a question does not apply to your situation, please tick the **N/A** (not applicable) box. Please insert an 'X' in the chosen box.

1.	I have a life insurance policy (or policies), which I intend to keep in force until death.	**YES**	**NO**	**N/A**
2.	I am a member of a medical aid scheme.	**YES**	**NO**	**N/A**
3.	I have health insurance, for example, gap cover, disability, or critical illness insurance.	**YES**	**NO**	**N/A**

SECTION D:

Please answer the following questions:

1.	**Current age**					
2.	**Planned retirement age**					
3.	**Relationship status**	Single	Married	Co-habiting	Widowed	Separated/ divorced
4.	**Health status**	Excellent	Very good	Good	Fair	Poor
5.	**Financial dependants**					
6.	**Children (including grandchildren)**					
7.	**Which of the following best describes your socio-economic status?**	Low income	Lower middle income	Higher middle income	High income	

APPENDIX H:

ANNUITY DECISION-MAKING TOOL: POST-RETIREMENT PERIOD

Appendix G and Appendix H include an annuity decision-making tool, each consisting of a questionnaire and user's manual, to be used by counsellors and financial advisors when guiding their clients in making an informed and well-considered decision with respect to choosing an optimal AIP.

The annuity decision-making tool is still in development, and will be converted into a sophisticated and user-friendly software application in the near future.

The first questionnaire and user's manual (Appendix G) are aimed at individuals in their pre-retirement period of having to choose between self-annuitisation and a guaranteed post-retirement income stream.

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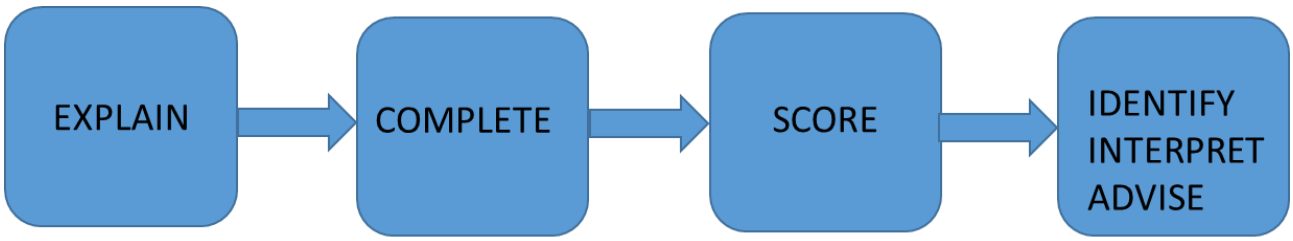
ANNUITY INCOME PRODUCT

DECISION-MAKING TOOL

(For living annuitants only.)

AN INSTRUCTION MANUAL FOR THE FINANCIAL ADVISOR

4-STEP ACTION PLAN



- *STEP 1:* ***Explain. Explain*** *the annuity income products to client. See "Information Sheet".*
- *STEP 2:* ***Complete.*** *The client* ***completes*** *the questionnaire. See "Annuity Income Product decision-making tool".*
- *STEP 3:* ***Score****. Score individually per question/item.*
- *STEP 4:* ***Identify, interpret and advise****. Identify factors and give interpretation based on score results. Advise client by focussing on discussion points. See "Interpretation Sheet".*

INFORMATION SHEET

When you retired from your retirement fund(s), you were required to convert your retirement capital into an income stream. The two main retirement income options available to you were: (1) a ***living*** **annuity** and (2) a ***guaranteed (or life)*** **annuity**.

Your two main retirement income options are summarised as follows:

1. Living annuity

- Invest your retirement capital into a product called a ***living*** **annuity**, where you choose the underlying investments. When choosing this option, you may withdraw pension income every year, subject to a minimum withdrawal rate of **2.5%** and a maximum withdrawal rate of **17.5%** of the total investment amount. *You may therefore choose the amount of income you receive each year, subject to the annual limits.*
- If the pension income you withdraw from your ***living*** **annuity** consistently **exceeds** the growth on your investment portfolio, the total investment amount could eventually become **DEPLETED** if you select this option. *You **CAN** therefore outlive your retirement capital.*
- If you have money left over in your ***living*** **annuity** when you die, it could be left to your heirs as an inheritance. In other words, with a ***living*** **annuity**, your remaining capital keeps on ***living***.

2. Guaranteed (or life) annuity

- The alternative option is to use your retirement capital to purchase an **insurance product**, called a ***guaranteed (or life)*** **annuity,** which **GUARANTEES** to pay you a **predetermined** pension income each year for the rest of your ***life***. *You therefore **CANNOT** outlive your retirement capital.*
- You have the choice of choosing either a pension that stays the same each year or a pension that escalates with a certain rate, e.g. the inflation rate, each year.
- If you live sufficiently long after retirement, the total amount of pension income you receive from your ***guaranteed (or life)*** **annuity** may **exceed** your original investment. However, if you die soon after retirement, you will receive in total **less** than what you have paid. In other words, a ***guaranteed (or life)*** **annuity** dies with you, and NO remaining capital can be left to your heirs. Put differently, a ***guaranteed (or life)*** **annuity** ends with your ***life.***

Take note:

- A **blended strategy** refers to a combined annuity income product that consists of both a living annuity and a guaranteed annuity.
- A **switching strategy** refers to an annuitant switching out of a living annuity and into a guaranteed annuity, either partly, or in full.

INTERPRETATION SHEET

A score between 5 and 7 on average for each factor on the following questions indicates high satisfaction as it relates to a living annuity income product. The following factors contribute to high satisfaction:

Table H.1: Satisfaction levels of living annuitants (increasing factors)

Q	Factor	Interpretation	Discussion points
7, 9, 12, 13	Financial literacy	High financial literacy contributes positively to satisfaction levels in retirement.	• Encourage client to stay informed. • Take ownership of financial future and wellbeing.
3, 4, 5	Post-retirement benefit perception	High benefit perception as measured by financial security, peace of mind and return on investment contributes positively to satisfaction levels.	• Discuss the influence of the following factors that could possibly account for this benefit perception, as follows: (i) RC Manage; (ii) accessibility; (iii) trust in advisor (LIV); (iv) AIP awareness; (v) bequest motive. • Critically examine the role of these factors and whether it justifies the longevity and investment risk taken by the client.
8,14	AIP awareness	Being aware of the different annuity income products contributes positively to satisfaction levels.	• Empower client with knowledge regarding pros and cons of the various different annuity income strategies.

A score between 5 and 7 on average for each factor on the following questions, indicates dissatisfaction with a living annuity. The following factors contribute to the dissatisfaction:

Table H.2: Satisfaction levels of living annuitants (decreasing factors)

Q	Factor	Interpretation	Discussion points
6	Fear of outliving RC	Having fear of outliving RC contributes negatively to satisfaction levels.	• Guaranteed annuity rates and benefits. • Blended strategy. • Switching strategy. • Longevity risk preference. • Biological versus chronological age.
1, 2	Managing RC	Managing RC in retirement contributes negatively to satisfaction levels.	• Guaranteed annuity rates and benefits. • Blended strategy. • Switching strategy.
10, 11	Mortality estimation (high)	A high mortality estimation (living until advanced ages) contributes positively to satisfaction levels.	• Risk of outliving retirement capital; dependence on family/state. • Disadvantage of managing retirement capital in old age/when sickly. • Guaranteed annuity rates and benefits.

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ANNUITY INCOME PRODUCT

DECISION-MAKING TOOL

(For living annuitants only.)

CLIENT NAME: _____

DATE: _____

SECTION A:

This questionnaire is a tool that will give you an indication of your satisfaction levels in retirement as they relate to your choice of an annuity income product.

There are mainly two types of annuity income options: (1) a ***living* annuity;** and (2) a ***guaranteed (or life)* annuity.**

A quick reminder of what the two options entail:

1. *Living* annuity

- You choose the underlying investments and the amount of pension income you receive each year, subject to a minimum and maximum withdrawal rate.
- You CAN outlive your retirement capital.
- If you have money left in your ***living* annuity**, it could be left to your heirs.

2. *Guaranteed (or life)* annuity

- You receive a GUARANTEED predetermined pension income each year for the rest of your ***life***.
- You CANNOT outlive your retirement capital.
- A ***guaranteed (or life)*** annuity dies with you, and NO remaining capital can be left to your heirs.

Take note:

- A **blended strategy** refers to a combined annuity income product that consists of both a living annuity and a guaranteed annuity.
- A **switching strategy** refers to an annuitant switching out of a living annuity and into a guaranteed annuity, either partly, or in full.

SECTION B:

There are no correct or incorrect responses to the statements in this section. Describe your perceptions as accurately as possible by ticking one of the seven response options. For each statement, tick the response option that best describes your point of view. If you are unable to respond to a question, please tick number 4.

Please insert an 'X' in the chosen box.

		Strongly Disagree						Strongly Agree
		1	**2**	**3**	**4**	**5**	**6**	**7**
1.	I do better by investing my retirement capital in a ***living* annuity**, because my capital has the potential to grow.							
2.	I like the flexibility and control of managing a ***living* annuity**.							
3.	The retirement income option I have chosen gives me peace of mind.							
4.	The retirement income option I have chosen gives me a fair return on my investment.							
5.	The retirement income option I have chosen gives me a sense of financial security.							
6.	I fear outliving my retirement capital.							
7.	Investing in retirement funds has the same tax advantages as other investment funds.							
8.	I am familiar with retirement income options.							
9.	All retirement funds guarantee to pay retirees a pension until their death.							
10.	It is likely that I will survive to age 85.							
11.	It is likely that I will survive to age 90 and beyond.							
12.	It makes sense to invest money in the shares of more than one company.							
13.	Pension fund law prohibits retirement funds to invest in shares.							
14.	I educate myself on retirement income options.							

SECTION C:

The following questions are **YES/NO** questions. If a question does not apply to your situation, please tick the **N/A** (not applicable) box. Please insert an 'X' in the chosen box.

1.	I buy and sell shares on the share market in my personal capacity.	**YES**	**NO**	**N/A**
2.	I have a life insurance policy (or policies), which I intend to keep in force until death.	**YES**	**NO**	**N/A**
3.	I am a member of a medical aid scheme.	**YES**	**NO**	**N/A**
4.	I have kept the death benefits provided by my employer's group life scheme in place after retirement.	**YES**	**NO**	**N/A**
5.	I have health insurance, for example, gap cover, disability, or critical illness insurance.	**YES**	**NO**	**N/A**
6.	I receive income from other assets, apart from my pension income.	**YES**	**NO**	**N/A**
7.	I continue to work in retirement for remuneration.	**YES**	**NO**	**N/A**

SECTION D:

Please answer the following questions:

1.	**Current age**					
2.	**Years retired**					
3.	**Relationship status**	Single	Married	Co-habiting	Widowed	Separated/ divorced
4.	**Health status**	Excellent	Very good	Good	Fair	Poor
5.	**Financial dependants**					
6.	**Children (including grandchildren)**					
7.	**Which of the following best describes your socio-economic status?**	Low income	Lower middle income	Higher middle income	High income	